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

1.1. Product identifier

Product form : Mixture

Trade name : **CT-100 ®**

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

1.2.1. Relevant identified uses

Main use category : Industrial uses, Professional uses

Use of the substance/mixture : Bio-Catalytic Water Treatment - For use in cooling towers

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Bio-Organic Catalyst, Inc.
711 W. 17th Street, Suite E-6
Costa Mesa, CA 92627, United States of America
T 011 949-515-1301
Info@bio-organic.com

1.4. Emergency telephone number

Emergency number : 011 917-513-8012

Country	Official advisory body	Address	Emergency number
Ireland	National Poisons Information Centre Beaumont Hospital	PO Box 1297 Beaumont Road 9 Dublin	+353 1 809 2566 (Healthcare professionals-24/7) +353 1 809 2166 (public, 8am - 10pm, 7/7)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Not classified

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Not applicable.

2.3. Other hazards

Other hazards : Causes mild skin and eye irritation. Results of PBT and vPvB assessment : Not applicable.

Contains no PBT/vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII

The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Yeast Extract	(CAS-No.) 8013-01-2 (EC-No.) 232-387-9	> 89,5	Not classified
Alcohols, C11-15-Secondary, Ethoxylated, Butoxylated	(CAS-No.) 68131-40-8 (EC-No.) 614-295-4	< 5,5	Skin Irrit. 2, H315 Eye Dam. 1, H318
Alcohols, C12-14-secondary, ethoxylated	(CAS-No.) 84133-50-6 (EC-No.) 617-534-0	< 40	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Dam. 1, H318
Silicic acid, disodium salt; Sodium metasilicate pentahydrate	6834-92-0	<1.0%	Acute Toxicity - 4 - H302 Acute Toxicity - 4 - H332 Skin Irritation - 2 - H315 Eye Damage - 1 - H318

Full text of H- and EUH-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

Additional advice : First aider: Pay attention to self-protection!. Concerning personal protective equipment to use, see section 8. Never give anything by mouth to an unconscious person. In case of doubt or persistent symptoms, consult always a physician. Show this safety data sheet to the doctor in attendance. Treat symptomatically.

Inhalation : Remove casualty to fresh air and keep warm and at rest. In case of doubt or persistent symptoms, consult always a physician.

Skin contact : Remove contaminated clothing and shoes. Gently wash with plenty of soap and water. In case of doubt or persistent symptoms, consult always a physician.

Eyes contact : Rinse immediately carefully and thoroughly with eye-bath or water. Remove contact lenses, if present and easy to do. Continue rinsing. In case of doubt or persistent symptoms, consult always a physician.

Ingestion : Rinse mouth thoroughly with water. Do not induce vomiting without medical advice. In case of doubt or persistent symptoms, consult always a physician.

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

Inhalation : Not expected to present a significant inhalation hazard under anticipated conditions of normal use.

Skin contact : The following symptoms may occur: Redness.

Eyes contact : The following symptoms may occur: Redness.

Ingestion	: Not expected to present a significant ingestion hazard under anticipated conditions of normal use.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Carbon dioxide (CO2), powder, alcohol-resistant foam, water spray. Use extinguishing media appropriate for surrounding fire.
Unsuitable extinguishing media	: Strong water jet. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

5.2. Special hazards arising from the substance or mixture

Specific hazards	: Not flammable. Heating will cause a rise in pressure with a risk of bursting.
Hazardous decomposition products in case of fire	: Carbon oxides (CO, CO2).

5.3. Advice for firefighters

Firefighting instructions	: Evacuate area. Use water spray or fog for cooling exposed containers. Contain the extinguishing fluids by bunding. Prevent fire fighting water from entering the environment.
Protection during firefighting	: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus.
Other information	: Do not allow run-off from fire-fighting to enter drains or water courses. Dispose of waste in accordance with environmental legislation.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

For non-emergency personnel	: Evacuate unnecessary personnel. Keep upwind. Provide adequate ventilation. Wear recommended personal protective equipment. Concerning personal protective equipment to use, see section 8. Avoid breathing vapours. Avoid contact with skin, eyes and clothing.

6.1.2. For emergency responders

For emergency responders	: Ensure procedures and training for emergency decontamination and disposal are in place. Concerning personal protective equipment to use, see section 8.

6.2. Environmental precautions

Do not allow to enter into surface water or drains. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up	: Stop leak if safe to do so. Dam up the liquid spill. Small quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal. Recover large spills by pumping (use an explosion proof or hand pump). Place in a suitable container for disposal in accordance with the waste regulations (see Section 13). This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

Concerning personal protective equipment to use, see section 8. Concerning disposal elimination after cleaning, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Provide adequate ventilation. Use personal protective equipment as required. Concerning personal protective equipment to use, see section 8. Avoid breathing vapours. Avoid contact with skin, eyes and clothing. Take any precaution to avoid mixing with Incompatible materials, Refer to Section 10 on Incompatible Materials. Ensure proper process control to avoid excess waste discharge (temperature, concentration, pH, time). Avoid release to the environment.

Hygiene measures : Keep good industrial hygiene. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Do not eat, drink or smoke when using this product. Remove contaminated clothes. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a dry, cool and well-ventilated place. Avoid high temperatures > 45 °C. Strong caustics and strong bases may affect the quality and condition of the product. Do not store near or with any of the incompatible materials listed in section 10. Bund storage facilities to prevent soil and water pollution in the event of spillage.

Maximum storage duration : 24 months The shelf life given is for unopened containers stored under moderate temperature conditions.

Packaging materials : Keep only in the original container. Suitable material: No specific measures identified. Unsuitable material: No specific measures identified.

7.3. Specific end use(s)

For further information see section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Additional information : No data available

8.2. Exposure controls

Engineering measure(s) : Provide adequate ventilation. Organisational measures to prevent/limit releases, dispersion and exposure. See Section 7 for information on safe handling.

Personal protective equipment : The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hand protection : Wear chemically resistant gloves (tested to EN374) . Protective gloves against chemicals and micro-organisms. Suitable material: Butyl rubber. NR (natural rubber, natural latex). Neoprene. NBR (Nitrile rubber). ethylene vinyl alcohol laminate (EVAL). Polyvinylchloride (PVC). Breakthrough time : > 480 min. Thickness. Not determined. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances.

Eye protection : Use suitable eye protection (EN166): Safety glasses

Body protection : Wear suitable protective clothing. Wear suitable working clothes

Respiratory protection : Not required for normal conditions of use

Thermal hazard protection : Not required for normal conditions of use. Use dedicated equipment.

Environmental exposure controls : Avoid release to the environment. Comply with applicable Community environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Liquid
Colour	: Pale yellow, amber
Odour	: Mild odour
Odour threshold	: Not applicable
pH	: Full strength concentrate 11.5-+/-.50 At recommended use dilutions, pH ranges 6.3 to 6.9
Relative evaporation rate (butylacetate=1)	: < 0,01 (calculated value)
Melting / freezing point	: No data available
Freezing point	: No data available
Initial boiling point and boiling range	: > 100 °C (calculated value)
Flash point	: > 93 °C (closed cup)
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability	: Not applicable,liquid
Vapour pressure	: No data available
Vapour density	: No data available
Relative density	: 1.04 (20 °C)
Solubility	: Water: 100 % completely soluble
Partition coefficient n-octanol/water	: No data available
Kinematic viscosity	: 2,337 cSt (40 °C)
Dynamic viscosity	: No data available
Explosive properties	: Not applicable. The study does not need to be conducted because there are no chemical groups associated with explosive properties present in the molecule.
Oxidising properties	: Not applicable. The classification procedure needs not to be applied because there are no chemical groups present in the molecule which are associated with oxidising properties.
Explosive limits	: No data available
Particle size	: Not applicable
Particle size distribution	: Not applicable
Particle shape	: Not applicable
Particle aspect ratio	: Not applicable
Particle aggregation state	: Not applicable
Particle agglomeration state	: Not applicable
Particle specific surface area	: Not applicable
Particle dustiness	: Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

Relative evaporation rate (butylacetate=1) : < 0,01 (calculated value)
Other properties : Pour point : 2,22 °C

SECTION 10: Stability and reactivity

10.1. Reactivity

None under normal conditions. Reference to other sections: 10.4 & 10.5.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

High temperatures. See Section 7 for information on safe handling.

10.5. Incompatible materials

Strong acids. Strong bases. Strong oxidizing agents. See Section 7 for information on safe handling.

10.6. Hazardous decomposition products

Reference to other sections 5.2.

SECTION 11: Toxicological information

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

Acute toxicity : Not classified (Based on available data, the classification criteria are not met)

CT-100 ®	
LD50/oral/rat	> 5000 mg/kg
LD50/dermal/rabbit	> 2000 mg/kg

Alcohols, C11-15-Secondary, Ethoxylated, Butoxylated (68131-40-8)	
LD50/oral/rat	2100 mg/kg
LD50/dermal/rat	> 2000 mg/kg

Alcohols, C12-14-secondary, ethoxylated (84133-50-6)	
LD50/oral/rat	2100 mg/kg

Skin corrosion/irritation : Not classified (Based on available data, the classification criteria are not met)

The information given on this Safety Data Sheet is based on tests done on the mixture itself. Final dermal irritation determination.It is a mild skin irritation based on a score of 2.09 compared to standard of draize score > 1.5, but < 2.3.

pH: Full Strength Concentrate 3.9 – 4.3
At recommended use dilutions, pH ranges 6.3 to 6.9

Serious eye damage/irritation : Not classified (Based on available data, the classification criteria are not met)

The information given on this Safety Data Sheet is based on tests done on the mixture itself. Utilization of InVitro International's Irritection Assay System was used to evaluate the product and is classified as a mild ocular irritant, under EU CLP classification, with an IDE score of 15.2, which reflects a classification of GHS Category 2B irritant.

pH: Full Strength Concentrate 3.9 – 4.3
At recommended use dilutions, pH ranges 6.3 to 6.9

Respiratory or skin sensitisation : Not classified (Based on available data, the classification criteria are not met)

Germ cell mutagenicity : Not classified (Based on available data, the classification criteria are not met)

Carcinogenicity : Not classified (Based on available data, the classification criteria are not met)

Reproductive toxicity : Not classified (Based on available data, the classification criteria are not met)

STOT-single exposure : Not classified (Based on available data, the classification criteria are not met)

STOT-repeated exposure : Not classified (Based on available data, the classification criteria are not met)

Aspiration hazard : Not classified (Based on available data, the classification criteria are not met)

CT-100 ®	
Kinematic viscosity	2,337 mm^2/s (40 °C)

Other information : Symptoms related to the physical, chemical and toxicological characteristics. For further information see section 4.

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties : The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %

11.2.2 Other information

Other information : Symptoms related to the physical, chemical and toxicological characteristics. For further information see section 4.

SECTION 12: Ecological information

12.1. Toxicity

Environmental properties : Not classified (CLP)

Hazardous to the aquatic environment, short–term (acute) : Not classified

Hazardous to the aquatic environment, long–term (chronic) : Not classified

CT-100 ®	
LC50 - Fish [1]	For this family of materials: LC50, fathead minnow (Pimephales promelas), static, 96 hrs. 100% survival rate at 1ppm.

LC50 - Fish [2]	Marine environment: The marine invertebrate species, Mysidopsis bahia (Americamysis bahia) and the marine vertebrate species, Menidia beryllina were used in the tests. For the marine invertebrate species, 48-Hour Acute Mysidopsis bahia survival test results: LC-50 -316.23 (ppm). The 96-Hour LC-50 (concentration at which 50% mortality is expected to occur) Menidia beryllina survival data was 203.04 (ppm).

Alcohols, C12-14-secondary, ethoxylated (84133-50-6)	
LC50 - Fish [1]	3,2 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 - Crustacea [1]	3,2 mg/l (Exposure time: 48 h - Species: water flea)

12.2. Persistence and degradability

CT-100 ®	
Persistence and degradability	Inherently biodegradable. For this family of materials: OECD Guideline for Testing of Chemicals, 302 B, Inherent Biodegradability: Zahn-Wellens/EMPA-Test Adopted: July 17, 1992, as well as German Standard Procedures for Water, Waste Water and Sludge Testing, Test procedure with water organisms (Group L) Determination of the biodegradability, Static Test (L25),DIN 38 412, Part 25.
Biodegradation	> 58 % 48h, OECD 302B. > 75% - 28 Days.

12.3. Bioaccumulative potential

CT-100 ®	
Partition coefficient n-octanol/water	No data available
Bioaccumulative potential	Low potential

12.4. Mobility in soil

CT-100 ®	
Mobility in soil	No data available

12.5. Results of PBT and vPvB assessment

CT-100 ®	
Results of PBT assessment	Not applicable

12.6. Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties : The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0.1 %

12.7. Other adverse effects

Other adverse effects : No data available. Not dangerous for the ozone layer.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Avoid release to the environment. Dispose of empty containers and wastes safely. See Section 7 for information on safe handling. Refer to manufacturer/supplier for information on recovery/recycling. Recycling is preferred to disposal or incineration. If recycling is not possible, eliminate in accordance with local valid waste disposal regulations. Handle contaminated packages in the same way as the substance itself. Dispose of contaminated materials in accordance with current regulations.

European waste catalogue (2001/573/EC, 75/442/EEC, 91/689/EEC) : Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	ADN	RID
14.1. UN number or ID number				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.2. UN proper shipping name				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.3. Transport hazard class(es)				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.4. Packing group				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.5. Environmental hazards				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
No supplementary information available				

14.6. Special precautions for user

Special precautions for user : No data available

- Overland transport

Not applicable

- Transport by sea

Not applicable

- Air transport

Not applicable

- Inland waterway transport

Not applicable

- Rail transport

Not applicable

14.7. Maritime transport in bulk according to IMO instruments

Code: IBC : No data available.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

Listed on REACH Annex XVII (Restriction Conditions). The following restrictions are applicable:

3(b) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10	Alcohols, C11-15-Secondary, Ethoxylated, Butoxylated ; Alcohols, C12-14-secondary, ethoxylated

Contains no substance(s) listed on the REACH Candidate List

Contains no substance(s) listed on REACH Annex XIV (Authorisation List)

Regulation (EC) No. 648/2004 (Detergents regulation) : When sold to the general public, additional labelling is required. CONTAINS : 5 % or over, but less than 15 % non-ionic surfactants. The surfactant(s) contained in this mixture complies(comply) with the biodegradability criteria as laid down in Regulation (EC) No.648/2004 on detergents. Data to support this assertion are held at the disposal of the competent authorities of the Member States and will be made available to them, at their direct request or at the request of a detergent manufacturer.

15.1.2. National regulations

France

No ICPE	Installations classées Désignation de la rubrique	Code Régime	Rayon
na	Not Applicable	na	na

Germany

Regulatory reference : WGK 1, Slightly hazardous to water (Classification according to AwSV, Annex 1)

German storage class (LGK) : LGK 12 - Non-combustible liquids

Hazardous Incident Ordinance (12. BImSchV) : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

Waterbezwaarlijkheid : B (5) - Weinig schadelijk voor in het water levende organismen

SZW-lijst van kankerverwekkende stoffen : None of the components are listed

SZW-lijst van mutagene stoffen : None of the components are listed

SZW-lijst van reprotoxische stoffen – Borstvoeding : None of the components are listed

SZW-lijst van reprotoxische stoffen – Vruchtbaarheid : None of the components are listed

SZW-lijst van reprotoxische stoffen – Ontwikkeling : None of the components are listed

15.2. Chemical safety assessment

Not applicable

SECTION 16: Other information

Abbreviations and acronyms:

	ABM = Algemene beoordelingsmethodiek
	ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC IATA = International Air Transport Association IMDG = International Maritime Dangerous Goods Code LEL = Lower Explosive Limit/Lower Explosion Limit UEL = Upper Explosion Limit/Upper Explosive Limit REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
	BTT = Breakthrough time (maximum wearing time)
	DMEL = Derived Minimal Effect level
	DNEL = Derived No Effect Level
	EC50 = Median Effective Concentration
	EL50 = Median effective level
	ErC50 = EC50 in terms of reduction of growth rate
	ErL50 = EL50 in terms of reduction of growth rate
	EWC = European waste catalogue
	LC50 = Median lethal concentration
	LD50 = Median lethal dose
	LL50 = Median lethal level
	NA = Not applicable
	NOEC = No observed effect concentration
	NOEL: no-observed-effect level
	NOELR = No observed effect loading rate
	NOAEC = No observed adverse effect concentration
	NOAEL = No observed adverse effect level
	N.O.S. = Not Otherwise Specified
	OEL = Occupational Exposure Limits - Short Term Exposure Limits (STELs)
	PNEC = Predicted No Effect Concentration
	Quantitative structure-activity relationship (QSAR)
	STOT = Specific Target Organ Toxicity
	TWA = time weighted average
	VOC = Volatile organic compounds
	WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)

Sources of key data used to compile the datasheet : ECHA (European Chemicals Agency), supplier sds, supplier information, Loli.

Training advice : Training staff on good practice.

Other information : Classification - Assessment method: CLP Calculation method (Article 9). Serious eye damage/eye irritation. skin irritation : Information given is based on tests on the mixture itself.

Full text of H- and EUH-statements:

Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Eye Dam. 1	Serious eye damage/eye irritation, Category 1

H302	Harmful if swallowed
H315	Causes skin irritation
H318	Causes serious eye damage
H332	Harmful if inhaled
Skin Irrit. 2	Skin corrosion/irritation, Category 2

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878
Classification according to Regulation (EC) No. 1272/2008 [CLP]
Labelling according to Regulation (EC) No. 1272/2008 [CLP]