SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE
COMPANY/UNDERTAKING

Product identifier
Common Name CEASE®

EPA Registration No. 264-1155-68539

Relevant identified uses of the substance or mixture and uses advised against
General Use Fungicide/Bactericide
Restrictions on use See product label for restrictions.

Manufactured By Bayer Environmental Science
2 T.W. Alexander Drive
Research Triangle PK, NC 27709

Distributed by BioWorks, Inc.
100 Rawson Rd., Suite 205
Victor, NY 14564

Emergency Telephone Number (24hr/ 7 days) Bayer Environmental Science: 800-334-7577
BioWorks, Inc.: 800-877-9443

Product Information Telephone Number CHEMTREC: 800-424-9300 (USA and Canada)

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200
This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Hazards Not Otherwise Classified (HNOC)
Micro-organisms may have the potential to provoke sensitising reactions.
No health hazards not otherwise classified.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name CAS-No. Concentration % by weight
Bacillus subtilis strain QST 713

Bacillus subtilis strain QST 713: 1.34

Bacillus subtilis strain QST 713: >= 1.0E+09 CFU/g
SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice
When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.

Inhalation
Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.

Skin contact
Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.

Eye contact
Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a physician or poison control center immediately.

Ingestion
Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed

Symptoms
No symptoms known or expected.

Indication of any immediate medical attention and special treatment needed

Treatment
Treat symptomatically. There is no specific antidote.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable
High volume water jet

Special hazards arising from the substance or mixture
Dangerous gases are evolved in the event of a fire.

Advice for firefighters

Special protective equipment for firefighters
Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.

Further information
Use appropriate extinguishing media for material that is supplying fuel. Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.
Flash point  > 91 °C
No flash point - Determination conducted up to the boiling point.

Auto-ignition temperature  475 °C / 887 °F
Lower explosion limit  No data available
Upper explosion limit  No data available
Explosivity  Not explosive
92/69/EEC, A.14 / OECD 113

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Precautions  Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up
Methods for cleaning up  Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Collect and transfer the product into a properly labelled and tightly closed container. Clean contaminated floors and objects thoroughly, observing environmental regulations. Clean with disinfectants.

Additional advice  Use personal protective equipment. If the product is accidentally spilled, do not allow to enter soil, waterways or waste water canal.

Reference to other sections  Information regarding safe handling, see section 7. Information regarding personal protective equipment, see section 8. Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling
Advice on safe handling  No specific precautions required when handling unopened packs/containers; follow relevant manual handling advice. Ensure adequate ventilation.

Advice on protection against fire and explosion  No special precautions required.

Hygiene measures  Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics. Remove Personal Protective Equipment (PPE) immediately after handling this product. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.
Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers
Store in original container and out of the reach of children, preferably in a locked storage area. Keep containers tightly closed in a dry, cool and well-ventilated place.

Advice on common storage
Keep away from food, drink and animal feedingstuffs.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacillus subtilis strain QST 713</td>
<td></td>
<td>20,000,000 CFU/m³</td>
<td></td>
<td>OES BCS*</td>
</tr>
</tbody>
</table>

*OES BCS: Internal Bayer AG, Crop Science Division "Occupational Exposure Standard"

Exposure controls

Personal protective equipment
In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection
Respiratory protection is not required under anticipated circumstances of exposure. When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

Hand protection
Waterproof gloves

Eye protection
Safety glasses with side-shields

Skin and body protection
Wear long-sleeved shirt and long pants and shoes plus socks.

General protective measures
Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water. Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
light brown

Physical State
suspension

Odor
sweet earthy

Odour Threshold
No data available

pH
5.2 - 5.4 (100 %) (23 °C)

Vapor Pressure
No data available
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Density</td>
<td>ca. 1.05 g/cm³ (20 °C)</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>&gt;= 100 °C / 212 °F</td>
</tr>
<tr>
<td>Melting / Freezing Point</td>
<td>No data available</td>
</tr>
<tr>
<td>Water solubility</td>
<td>dispersible</td>
</tr>
<tr>
<td>Minimum Ignition Energy</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Viscosity</td>
<td>10 - 100 mPa.s (21 °C)</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 91 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>475 °C / 887 °F</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosivity</td>
<td>Not explosive 92/69/EEC, A.14 / OECD 113</td>
</tr>
<tr>
<td>Other information</td>
<td>Further safety related physical-chemical data are not known.</td>
</tr>
</tbody>
</table>

**SECTION 10: STABILITY AND REACTIVITY**

<table>
<thead>
<tr>
<th>Reactivity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal decomposition</td>
<td>No data available</td>
</tr>
<tr>
<td>Chemical stability</td>
<td>Stable under recommended storage conditions.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>No hazardous reactions when stored and handled according to prescribed instructions.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>freezing</td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>No data available</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>No decomposition products expected under normal conditions of use.</td>
</tr>
</tbody>
</table>
SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes
Inhalation, Eye contact, Skin contact

Immediate Effects
Eye
May cause mild irritation to eyes.

Skin
May cause mild irritation to the skin.

Inhalation
Harmful if inhaled. Mists may cause respiratory tract irritation.

Information on toxicological effects

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

Acute inhalation toxicity
LC50 (Rat) > 5.19 mg/l
Exposure time: 4 h
Determined in the form of liquid aerosol.

Acute dermal toxicity
LD50 (Rabbit) > 2,000 mg/kg

Skin corrosion/irritation
No skin irritation (Rabbit)

Serious eye damage/eye irritation
No eye irritation (Rabbit)

Respiratory or skin sensitisation
Skin: Non-sensitizing. (Guinea pig)
Test conducted with a similar formulation.

Assessment STOT Specific target organ toxicity – repeated exposure
Bacillus subtilis did not cause specific target organ toxicity in experimental animal studies.

Assessment mutagenicity
Bacillus subtilis: Test not required for microorganisms.

Assessment carcinogenicity
Bacillus subtilis: Test not required for microorganisms.

ACGIH
None.

NTP
None.

IARC
None.

OSHA
None.

Assessment toxicity to reproduction
Bacillus subtilis: Test not required for microorganisms.

Assessment developmental toxicity
Bacillus subtilis: Test not required for microorganisms.
SECTION 12: ECOLOGICAL INFORMATION

Toxicity to fish

<table>
<thead>
<tr>
<th>LC50 (Oncorhynchus mykiss (rainbow trout))</th>
<th>162 mg/l 3.24 x 10^9 CFU/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time: 30 d</td>
<td></td>
</tr>
<tr>
<td>The value mentioned relates to the active ingredient.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOEC (Oncorhynchus mykiss (rainbow trout))</th>
<th>86 mg/l 1.72 x 10^9 CFU/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time: 30 d</td>
<td></td>
</tr>
<tr>
<td>The value mentioned relates to the active ingredient.</td>
<td></td>
</tr>
</tbody>
</table>

Toxicity to aquatic invertebrates

<table>
<thead>
<tr>
<th>EC50 (Daphnia magna (Water flea))</th>
<th>108 mg/l 2.16 x 10^9 CFU/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time: 48 h</td>
<td></td>
</tr>
<tr>
<td>The value mentioned relates to the active ingredient.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOEC (Daphnia magna (Water flea))</th>
<th>13 mg/l 2.6 x 10^8 CFU/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time: 48 h</td>
<td></td>
</tr>
<tr>
<td>The value mentioned relates to the active ingredient.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EC50 (Daphnia magna (Water flea))</th>
<th>1.6 x 10^6 CFU/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time: 21 d</td>
<td></td>
</tr>
<tr>
<td>The value mentioned relates to the active ingredient.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOEC (Daphnia magna (Water flea))</th>
<th>7.9 x 10^5 CFU/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time: 21 d</td>
<td></td>
</tr>
<tr>
<td>The value mentioned relates to the active ingredient.</td>
<td></td>
</tr>
</tbody>
</table>

Toxicity to aquatic plants

<table>
<thead>
<tr>
<th>NOEC (Desmodesmus subspicatus (green algae))</th>
<th>&gt;= 100 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value mentioned relates to the active ingredient.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOEC (Desmodesmus subspicatus (green algae))</th>
<th>&gt; 100 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value mentioned relates to the active ingredient.</td>
<td></td>
</tr>
</tbody>
</table>

Biodegradability

| Bacillus subtilis: |
| Evaluation of biodegradability is not relevant for micro-organisms. |

Bioaccumulation

| Bacillus subtilis: |
| Evaluation of bioaccumulation is not relevant for micro-organisms. |

Mobility in soil

| Bacillus subtilis: Evaluation of mobility in soil is not relevant for micro-organisms. |

Environmental precautions

Do not allow to get into surface water, drains and ground water.
Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water.
Do not apply when weather conditions favor runoff or drift.
Apply this product as specified on the label.
SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product

It is best to use all of the product in accordance with label directions. If it is necessary to dispose of unused product, please follow container label instructions and applicable local guidelines. Never place unused product down any indoor or outdoor drain.

Contaminated packaging

Triple rinse containers.
Puncture container to avoid re-use.
Dispose of empty container in a sanitary landfill or by incineration, or, if allowed by State/Provincial and local authorities, by burning.
If burned, stay out of smoke.
Follow advice on product label and/or leaflet.

RCRA Information

Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

According to national and international transport regulations this material is not classified as dangerous goods / hazardous material.

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 264-1155-68539
US Federal Regulations
TSCA list
Water 7732-18-5
US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D) Not applicable.
SARA Title III - Section 302 - Notification and Information None.
SARA Title III - Section 313 - Toxic Chemical Release Reporting None.
US States Regulatory Reporting
CA Prop65
This product contains a chemical known to the State of California to cause cancer.
Attapulgite clay 12174-11-7
Crystalline quartz (respirable) 14808-60-7
This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients
Attapulgite clay 12174-11-7 CA
Crystalline quartz (respirable) 14808-60-7 MN, RI
1,2-Propanediol 57-55-6 MN, RI

**EPA/FIFRA Information:**
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information required on the pesticide label:

**Signal word:** Caution!

**Hazard statements:**
Harmful if inhaled.
Avoid breathing spray mist.
Remove and wash contaminated clothing before re-use.

**SECTION 16: OTHER INFORMATION**

**Abbreviations and acronyms**
- **49CFR**: Code of Federal Regulations, Title 49
- **ACGIH**: US. ACGIH Threshold Limit Values
- **ATE**: Acute toxicity estimate
- **CAS-Nr.**: Chemical Abstracts Service number
- **CERCLA**: Comprehensive Environmental Response, Compensation, and Liability Act
- **EINECS**: European inventory of existing commercial substances
- **ELINCS**: European list of notified chemical substances
- **IARC**: International Agency for Research on Cancer
- **IATA**: International Air Transport Association
- **IMDG**: International Maritime Dangerous Goods
- **N.O.S.**: Not otherwise specified
- **NTP**: US. National Toxicology Program (NTP) Report on Carcinogens
- **OECD**: Organization for Economic Co-operation and Development
- **TDG**: Transportation of Dangerous Goods
- **TWA**: Time weighted average
- **UN**: United Nations
- **WHO**: World health organisation

**NFPA 704 (National Fire Protection Association):**
- Health - 1
- Flammability - 1
- Instability - 0
- Others - none

- Health - 0
- Flammability - 1
- Physical Hazard - 0
- PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard
Reason for Revision: Reviewed and updated for general editorial purposes. The following sections have been revised: Section 5: Fire Fighting Measures. Section 9: Physical and Chemical Properties. Section 11: Toxicological Information.

Revision Date: 02/15/2019

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