

SAFETY DATA SHEET

according to OSHA Hazard Communication Standard 29CFR
1910.1200 (HCS 2012)



BOVIBROM

SDS Number: RS_000001589

Version
1.1

Revision Date:
03/04/2020

Date of last issue: 02/10/2020
Date of first issue: 02/10/2020

Print Date:
02/09/2021

SECTION 1. IDENTIFICATION

Product name : BOVIBROM
Substance name : 1,3-dibromo-5,5-dimethylhydantoin
CAS-No. : 77-48-5

Manufacturer or supplier's details

Company name of supplier : Albemarle Corporation
Address : 4250 Congress Street, Suite 900
Charlotte , NC 28209
United States of America (USA)
Telephone : 980.299.5700
Telefax : 980.299.5512
Emergency telephone : +32 (0) 70-233-201 (EUROPE)
(+1)225-344-7147 (US and WORLDWIDE)
+65-6733-1661 (ASIA PACIFIC)
+86-532-8388-9090 (CHINA)
+61 2 8014 4558 or 18000 74234 (Australia)

Contact person product safety : DEPARTMENT OF PRODUCT SAFETY
E-mail address : PRODUCTSAFETY@ALBEMARLE.COM

Recommended use of the chemical and restrictions on use

Recommended use : Beef carcass antimicrobial
Restrictions on use : Use only in closed systems.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Oxidizing solids : Category 3
Corrosive to Metals : Category 1

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Acute toxicity (Oral) : Category 4
Skin irritation : Category 2
Eye irritation : Category 2A
Short-term (acute) aquatic hazard : Category 1

GHS label elements

Hazard pictograms :



Signal Word : Warning

Hazard Statements : H272 May intensify fire; oxidizer.
H290 May be corrosive to metals.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H400 Very toxic to aquatic life.

Precautionary Statements :

Prevention:

P210 Keep away from heat.
P220 Keep/Store away from clothing/ combustible materials.
P221 Take any precaution to avoid mixing with combustibles.
P234 Keep only in original container.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

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P390 Absorb spillage to prevent material damage.
P391 Collect spillage.

Storage:

P406 Store in corrosive resistant container with a resistant inner liner.

Disposal:

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

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance
Substance name : 1,3-dibromo-5,5-dimethylhydantoin
CAS-No. : 77-48-5

Components

| Chemical name | CAS-No. | Concentration (% w/w) |
|-----------------------------------|---------|-----------------------|
| 1,3-dibromo-5,5-dimethylhydantoin | 77-48-5 | >= 90 - <= 100 |

SECTION 4. FIRST AID MEASURES

General advice : First Aid responders should pay attention to self-protection and use the recommended protective clothing
Ensure that eyewash stations and safety showers are close to the workstation location.

If inhaled : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
If breathing is difficult, give oxygen.
If breathing is irregular or stopped, administer artificial respiration.
Keep the victim calm and in a semi-upright position.
Consult a physician.

In case of skin contact : IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
If symptoms persist, call a physician.

In case of eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

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-
- If swallowed : IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- Most important symptoms and effects, both acute and delayed : Irritation
See Section 2.
- Notes to physician : Treat symptomatically.
For specialist advice physicians should contact the Poisons Information Service.
-

SECTION 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Carbon dioxide (CO₂)
Dry chemical
Foam
Water mist
- Unsuitable extinguishing media : No information available.
- Specific hazards during fire fighting : May release toxic, irritating and/or corrosive gases.
In the event of fire and/or explosion do not breathe fumes.
- Hazardous combustion products : Bromine
Carbon oxides
- Further information : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for fire-fighters : Wear full protective clothing and self-contained breathing apparatus.
-

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Avoid dust formation.
Ensure adequate ventilation.
Evacuate personnel to safe areas.
Wear personal protective equipment.
- Environmental precautions : Avoid release to the environment.
Do not allow contact with soil, surface or ground water.
Prevent further leakage or spillage if safe to do so.
- Methods and materials for containment and cleaning up : Pick up and transfer to properly labeled containers.
Clean contaminated floors and objects thoroughly while observing environmental regulations.
Do not flush with water.
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Do not empty into drains.

SECTION 7. HANDLING AND STORAGE

- Advice on protection against fire and explosion : No special protective measures against fire required.
- Advice on safe handling : Avoid dust accumulation in enclosed space.
Provide sufficient air exchange and/or exhaust in work rooms.
Avoid contact with skin and eyes.
Wash hands and face before breaks and immediately after handling the product.
For personal protection see section 8.
In general, emissions are controlled and prevented by implementing an appropriate management system, including regular informing and training workers.
- Conditions for safe storage : Keep containers tightly closed in a dry, cool and well-ventilated place.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Protect from moisture.
Mechanical ventilation is recommended.
Local exhaust is needed at source of dust.
- May be corrosive to metals.
Store in corrosive resistant container with a resistant inner liner.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

- Engineering measures** : This substance should be handled under strictly controlled conditions as specified in REACH regulation article 18(4).
Site documentation to support safe handling arrangements in accordance with risk-based management system should be available at each manufacturing site. During the whole lifecycle all necessary measures should be undertaken to minimize emissions and any resulting exposure.

Use product only in closed system.

Provide sufficient air exchange and/or exhaust in work rooms.

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Use with local exhaust ventilation.

Personal protective equipment

Respiratory protection : Respirator with a dust filter

Hand protection

Material : Gloves resistant to chemical permeation.

Remarks : Rubber gloves.

Eye protection : Wear safety glasses with side shields or goggles.

Skin and body protection : In case of skin contact or contamination of clothing,
protective clothing should be worn.

Protective measures : Handle in accordance with good industrial hygiene and safety
practice.

Hygiene measures : Handle in accordance with good industrial hygiene and safety
practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : powder

Color : white

Odor : halogen

Odor Threshold : No data available

pH : 6.7
Concentration: 1 %

Melting point/freezing point : 370 °F / 188 °C

Initial boiling point and boiling
range : No data available

Flash point : Not applicable solid

Evaporation rate : Negligible

Flammability (solid, gas) : The product is not flammable.

Flammability (liquids) : Not applicable

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| | | |
|--|---|--|
| Burning number | : | No data available |
| Upper explosion limit / Upper flammability limit | : | Not applicable |
| Lower explosion limit / Lower flammability limit | : | Not applicable |
| Vapor pressure | : | < 0.1 hPa (77 °F / 25 °C) |
| Relative vapor density | : | No data available |
| Relative density | : | No data available |
| Density | : | ca. 1 g/cm ³ |
| Solubility(ies) | | |
| Water solubility | : | ca. 1 g/l |
| Solubility in other solvents | : | No data available |
| Partition coefficient: n-octanol/water | : | No data available |
| Autoignition temperature | : | None. |
| Decomposition temperature | : | Stable up to the melting point. |
| Viscosity | | |
| Viscosity, dynamic | : | Not applicable solid |
| Viscosity, kinematic | : | Not applicable solid |
| Explosive properties | : | No chemical groups associated to explosive properties. |
| Oxidizing properties | : | May intensify fire; oxidizer. Method: Regulation (EC) No. 440/2008, Annex, A.17 |
| Self-heating substances | : | The substance or mixture is not classified as self heating. |
| Surface tension | : | Not applicable, solid |
| Sublimation point | : | Not applicable |
| Molecular weight | : | 285.92 g/mol |
| Metal corrosion rate | : | Corrosive to metals |

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SECTION 10. STABILITY AND REACTIVITY

- Reactivity : No dangerous reaction known under conditions of normal use.
- Chemical stability : Stable under normal conditions.
- Possibility of hazardous reactions : No dangerous reaction known under conditions of normal use.
- Conditions to avoid : Avoid extremely high temperatures.
Keep away from open flames, hot surfaces and sources of ignition.
Protect from moisture.
- Incompatible materials : This product is a strong oxidizing and brominating agent.
Avoid contact with reducing agents, acids, ammonia-containing products, organic materials (such as aldehydes and alcohols) and other oxidizing agents (such as calcium hypochlorite).

Avoid contact with common metals such as aluminum, iron, copper, brass and steel. Contact with incompatible materials can promote the exothermic decomposition of the product.

Take any precaution to avoid mixing with combustibles.
- Hazardous decomposition products : Bromine
Carbon oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Components:

1,3-dibromo-5,5-dimethylhydantoin:

- Acute oral toxicity : LD50 (Rat, female): 1,107 mg/kg
- Acute inhalation toxicity : LC50 (Rat): 24.9 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist
- Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg

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Skin corrosion/irritation

Components:

1,3-dibromo-5,5-dimethylhydantoin:

Species : Rabbit
Method : According to a standard method
Result : Irritating to skin.

Serious eye damage/eye irritation

Components:

1,3-dibromo-5,5-dimethylhydantoin:

Species : Rabbit
Result : Irritating to eyes.
Method : According to a standard method

Respiratory or skin sensitization

Components:

1,3-dibromo-5,5-dimethylhydantoin:

Routes of exposure : Skin contact
Species : Guinea pig
Result : Did not cause sensitization on laboratory animals.

Germ cell mutagenicity

Components:

1,3-dibromo-5,5-dimethylhydantoin:

Genotoxicity in vitro : Test Type: Microbial mutagenesis assay (Ames test)
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Result: negative

Germ cell mutagenicity - Assessment : Not classified due to lack of data.

Carcinogenicity

Components:

1,3-dibromo-5,5-dimethylhydantoin:

Carcinogenicity - Assessment : Not classified due to lack of data.

IARC No ingredient of this product present at levels greater than or equal to 0.1% is

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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

Components:

1,3-dibromo-5,5-dimethylhydantoin:

Reproductive toxicity - Assessment : Not classified due to lack of data.

STOT-single exposure

Components:

1,3-dibromo-5,5-dimethylhydantoin:

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT-repeated exposure

Components:

1,3-dibromo-5,5-dimethylhydantoin:

Assessment : Not classified due to lack of data.

Aspiration toxicity

Components:

1,3-dibromo-5,5-dimethylhydantoin:

Not classified due to data which are conclusive although insufficient for classification.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

1,3-dibromo-5,5-dimethylhydantoin:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.4 mg/l
Exposure time: 48 h

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Test Type: static test

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.7 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test

M-Factor (Chronic aquatic toxicity) : 1

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Not classified due to lack of data.

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

Product:

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances

Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.

Contaminated packaging : Refer to manufacturer/ supplier for information on recovery/ recycling.

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SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number : UN 3085
Proper shipping name : OXIDIZING SOLID, CORROSIVE, N.O.S.
(1,3-dibromo-5,5-dimethylhydantoin)
Class : 5.1
Subsidiary risk : 8
Packing group : II
Labels : 5.1 (8)

IATA-DGR

UN/ID No. : UN 3085
Proper shipping name : Oxidizing solid, corrosive, n.o.s.
(1,3-dibromo-5,5-dimethylhydantoin)
Class : 5.1
Subsidiary risk : 8
Packing group : II
Labels : Oxidizer, Corrosive
Packing instruction (cargo aircraft) : 562
Packing instruction (passenger aircraft) : 558

IMDG-Code

UN number : UN 3085
Proper shipping name : OXIDIZING SOLID, CORROSIVE, N.O.S.
(1,3-dibromo-5,5-dimethylhydantoin)
Class : 5.1
Subsidiary risk : 8
Packing group : II
Labels : 5.1 (8)
EmS Code : F-A, S-Q
Marine pollutant : yes

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

Not applicable for product as supplied.

Domestic regulation

49 CFR

UN/ID/NA number : UN 3085
Proper shipping name : Oxidizing solid, corrosive, n.o.s.
(1,3-dibromo-5,5-dimethylhydantoin)
Class : 5.1
Subsidiary risk : 8
Packing group : II
Labels : OXIDIZER, CORROSIVE
ERG Code : 140

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Marine pollutant : yes(1,3-dibromo-5,5-dimethylhydantoin)

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA 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 : Oxidizer (liquid, solid or gas)
Corrosive to Metals
Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation

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.

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

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US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

1,3-dibromo-5,5-dimethylhydantoin 77-48-5

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

California Prop. 65

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

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

| | | |
|--------|---|--|
| EINECS | : | On the inventory, or in compliance with the inventory |
| DSL | : | All components of this product are on the Canadian DSL |
| AICS | : | On the inventory, or in compliance with the inventory |
| NZIoC | : | On the inventory, or in compliance with the inventory |
| ENCS | : | On the inventory, or in compliance with the inventory |
| ISHL | : | On the inventory, or in compliance with the inventory |
| KECI | : | On the inventory, or in compliance with the inventory |
| PICCS | : | On the inventory, or in compliance with the inventory |
| IECSC | : | On the inventory, or in compliance with the inventory |
| TCSI | : | On the inventory, or in compliance with the inventory |
| TSCA | : | On TSCA Inventory |

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

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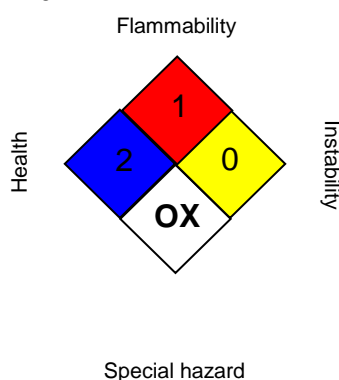
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SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:

| | | |
|-----------------|---|---|
| HEALTH | / | 2 |
| FLAMMABILITY | | 1 |
| PHYSICAL HAZARD | | 4 |

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

AICS - Australian Inventory of Chemical Substances; 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 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 concern-

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ing 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; 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

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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 given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / Z8