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

1.1. Product identifier

Product form : Mixture
Trade name : VAPROX® HC Sterilant
Product code : PB007, PB028, PB011, PB012
SDS No : A124

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

1.2.1. Relevant identified uses

Industrial/Professional use spec : Product for industrial use only
Use of the substance/mixture : For use only with STERIS V-PRO® Sterilizers

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

STERIS Corporation
5960 Heisley Road, Mentor OH 44060, USA
Telephone Number for Information: 1-800-548-4873 (Customer Service-Healthcare Products)
US Emergency Telephone No.1-314-535-1395 (STERIS); 1-800-424-9300 (CHEMTREC)

1.4. Emergency telephone number

Emergency number : US Emergency Telephone No.1-314-535-1395 (STERIS); 1-800-424-9300 (CHEMTREC)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS classification

Ox. Liq. 2 H272
Acute Tox. 4 (Oral) H302
Acute Tox. 4 (Inhalation:dust,mist) H332
Skin Corr. 1B H314
STOT SE 3 H335

Full text of H-phrases: see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements-This product is regulated by the US FDA and Health Canada and is exempt from GHS labelling.

Labelling according to GHS

Hazard pictograms (GHS) :

Signal word (GHS) : Danger

Hazard statements (GHS) : H272 - May intensify fire; oxidiser
H302 - Harmful if swallowed
H332 - Harmful if inhaled
H314 - Causes severe skin burns and eye damage
H335 - May cause respiratory irritation

Precautionary statements (GHS) : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P261- Avoid breathing mist and/or vapours
VAPROX® HC
Sterilant
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P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P370 + P378 – In case of fire: Use water for extinction

2.3. Other hazards
Risk of decomposition by heat or by contact with incompatible materials.

SECTION 3: Composition/information on ingredients

3.1. Substance
Not applicable

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>(CAS No) 7722-84-1</td>
<td>59</td>
<td>Ox. Liq. 1, H271 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Skin Corr. 1A, H314 STOT SE 3, H335</td>
</tr>
</tbody>
</table>

Full text H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general: Never give anything by mouth to an unconscious person. In all cases of doubt, or when symptoms persist, seek medical attention

First-aid measures after inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. Immediately get medical attention

First-aid measures after skin contact: Remove contaminated clothing immediately. Immediately flush skin with plenty of water for at least 15 minutes. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse

First-aid measures after eye contact: In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Immediately get medical attention. Remove contact lenses, if present and easy to do. Continue rinsing.

First-aid measures after ingestion: If victim completely conscious/alert, give water or milk. Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention. Call a POISON CENTER/doctor/physician if you feel unwell.

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

Symptoms/injuries: Hydrogen peroxide at these concentrations is a strong oxidant. Causes severe skin burns and eye damage

Symptoms/injuries after inhalation: Harmful if inhaled. Possible inflammation or irritation of the respiratory tract or pulmonary edema.

Symptoms/injuries after eye contact: Eye contact with concentrated solutions may cause severe eye damage followed by loss of sight

Symptoms/injuries after ingestion: Swallowing a small quantity of this material will result in serious health hazard. Severe irritation or burns to the mouth, throat, esophagus, and stomach

4.3. Indication of any immediate medical attention and special treatment needed
No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Water or water fog

Unsuitable extinguishing media: Do not use foam, dry powder or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire: Hydrogen peroxide at these concentrations is a strong oxidant. On decomposition releases oxygen which may intensify fire. Containers may swell and burst during a fire due to internal pressure caused by heat
5.3. Advice for firefighters

Precautionary measures fire
On heating, there is a risk of bursting due to internal pressure build-up. Cool down the containers exposed to heat with a water spray.

Firefighting instructions
Exercise caution when fighting any chemical fire. Use water spray or fog for cooling exposed containers. Prevent fire-fighting water from entering environment.

Protective equipment for firefighters
Use self-contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.

Other information
Oxygen evolution decomposition may burst sealed containers and accelerate the burning rates of other combustible materials. Damp material in contact with paper, wood, cloth, etc. may cause spontaneous combustion of the organic material.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures
Ensure adequate ventilation. Do not breathe fumes or vapors. Avoid contact with skin, eyes and clothes. Contain spill if safe to do so.

6.1.1. For non-emergency personnel

Protective equipment
Wear protective gloves and eye/face protection. For further information refer to section 8: Exposure-controls/personal protection.

Emergency procedures
Contain spill if safe to do so. Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment
Equip cleanup crew with proper protection.

Emergency procedures
Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up
Spills should be contained and may be cautiously neutralized with sodium metabisulfite or sodium sulfite (1.0 lb of either to 100 ml peroxide), or absorbed on appropriate materials and placed in a container for disposal. Do not use sawdust or cellulose materials as an absorbent. Flush spill site with large quantities of water (20 parts water to 1 part hydrogen peroxide) to a sanitary sewer.

Other information
Combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed. Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in fire.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling
Read and observe all labeled use instructions.

Hygiene measures
Take care for general good hygiene and housekeeping. Wash hands thoroughly after handling. Contaminated clothing should be washed thoroughly in order to eliminate a delayed potential fire hazard. Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures
Provide adequate ventilation. A washing facility/water for eye and skin cleaning purposes should be present. Floors should be impervious, resistant to liquids and easy to clean.

Storage conditions
Store in a cool, well ventilated place.

Incompatible materials

Prohibitions on mixed storage
Keep away from incompatible materials.

Storage area
Store in dry, cool, well-ventilated area.

Special rules on packaging
Correctly labelled.
SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Hydrogen peroxide (7722-84-1)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>USA - ACGIH ACGIH TWA (ppm)</td>
<td>1 ppm</td>
</tr>
<tr>
<td>USA - NIOSH NIOSH IDLH (ppm)</td>
<td>75 ppm</td>
</tr>
<tr>
<td>USA - NIOSH NIOSH REL (TWA) (mg/m³)</td>
<td>1.4 mg/m³</td>
</tr>
<tr>
<td>USA - NIOSH NIOSH REL (TWA) (ppm)</td>
<td>1 ppm</td>
</tr>
<tr>
<td>USA - OSHA OSHA PEL (TWA) (mg/m³)</td>
<td>1.4 mg/m³</td>
</tr>
<tr>
<td>USA - OSHA OSHA PEL (TWA) (ppm)</td>
<td>1 ppm</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Appropriate engineering controls: Ensure adequate ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Local exhaust ventilation is recommended to maintain vapor level below the threshold limit value (TLV).

Personal protective equipment: Personal protective equipment should be selected based upon the conditions under which this product is handled or used. Protective clothing. Gloves. Protective goggles. Avoid all unnecessary exposure.

Hand protection: Wear protective gloves. Use gloves constructed of chemical resistant materials such as nitrile, neoprene, rubber, or vinyl if frequent or prolonged contact is expected.

Eye protection: Wear protective eyewear.

Skin and body protection: Wear suitable protective clothing. Chemical resistant lab coat and closed toe shoes.

Respiratory protection: None required for routine use. In emergency situations where established limits are exceeded, it is recommended to use SCBA (Self-Contained Breathing Apparatus).

Other information: Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Clear</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>≤ 3.5</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>&gt;1</td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>-55°C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>119°C</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&gt; 85°C</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Non flammable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>14.2 mm Hg @ 30°C</td>
</tr>
<tr>
<td>Relative vapour density at 20 °C</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Density</td>
<td>1.24 g/ml Specific Gravity @ 20°C</td>
</tr>
</tbody>
</table>
**VAPROX® HC Sterilant**

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### Solubility
- Water: completely soluble

### Log Pow
- -1.57 @ 20°C

### Viscosity, kinematic
- No data available

### Viscosity, dynamic
- 1.079 cP @ 25°C

### Explosive properties
- Not explosive

### Oxidising properties
- Oxidizer

### Explosive limits
- Not explosive

---

### 9.2. Other information

No additional information available

---

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity
Reactive and oxidizing agent.

#### 10.2. Chemical stability
Stable under normal conditions of use.

#### 10.3. Possibility of hazardous reactions
Hazardous polymerization will not occur. Contamination may cause rapid decomposition, oxygen gas release and dangerous pressures

#### 10.4. Conditions to avoid
Extremely high or low temperatures. Protect from all contamination

#### 10.5. Incompatible materials
- Cyanides, hexavalent chromium compounds, nitric acid, potassium permanganate, oxidizers, reducers, combustible materials, flammable vapors, alkalis, copper, dirt, dust, iron, heavy metals and their salts and organic materials (especially vinyl monomers)

#### 10.6. Hazardous decomposition products
Contamination may cause rapid decomposition, oxygen gas release and dangerous pressures

---

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

**Acute toxicity**
- Harmful if swallowed. Harmful if inhaled.

<table>
<thead>
<tr>
<th>VAPROX® HC Sterilant</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE (oral)</td>
<td>500.000 mg/kg bodyweight</td>
</tr>
<tr>
<td>ATE (dust,mist)</td>
<td>1.500 mg/l/4h</td>
</tr>
</tbody>
</table>

**Hydrogen peroxide (7722-84-1)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>801 mg/kg</td>
</tr>
<tr>
<td>LD50 dermal rat</td>
<td>4060 mg/kg</td>
</tr>
<tr>
<td>LD50 dermal rabbit</td>
<td>2000 mg/kg</td>
</tr>
<tr>
<td>LC50 inhalation rat (mg/l)</td>
<td>2 g/m³ (Exposure time: 4 h)</td>
</tr>
<tr>
<td>ATE (oral)</td>
<td>801.000 mg/kg bodyweight</td>
</tr>
<tr>
<td>ATE (dermal)</td>
<td>2000.000 mg/kg bodyweight</td>
</tr>
<tr>
<td>ATE (gases)</td>
<td>4500.000 ppmv/4h</td>
</tr>
<tr>
<td>ATE (vapours)</td>
<td>2.000 mg/l/4h</td>
</tr>
<tr>
<td>ATE (dust,mist)</td>
<td>2.000 mg/l/4h</td>
</tr>
</tbody>
</table>

**Skin corrosion/irritation**
- Causes severe skin burns and eye damage
  - pH: <= 3.5

**Serious eye damage/irritation**
- Serious eye damage, category 1, implicit
  - pH: <= 3.5

**Respiratory or skin sensitisation**
- Not a sensitizer

**Germ cell mutagenicity**
- This product is not recognized as mutagenic by Research Agencies.
  - In vivo tests did not show mutagenic effects.
Carcinogenicity: IARC, NTP and OSHA do not list this product or its ingredients as carcinogens. ACGIH lists hydrogen peroxide as a “Confirmed Animal Carcinogen with Unknown Relevance to Humans” A3.

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


Specific target organ toxicity (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

Potential Adverse human health effects and symptoms: Harmful if swallowed. Harmful to eyes and skin.

SECTION 12: Ecological information

12.1. Toxicity
Ecology - water: Harmful to aquatic life with long lasting effects

Hydrogen peroxide (7722-84-1)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fishes 1</td>
<td>16.4 mg/l (Exposure time: 96 h - Species: Pimephales promelas)</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
<td>7.7 mg/l (Exposure time: 24 h - Species: Daphnia magna)</td>
</tr>
<tr>
<td>EC50 other aquatic organisms 1</td>
<td>2.5 mg/l (Exposure time: 72 h - Species: Chlorella vulgaris)</td>
</tr>
<tr>
<td>LC50 fish 2</td>
<td>18 - 56 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [Static])</td>
</tr>
<tr>
<td>EC50 Daphnia 2</td>
<td>18 - 32 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

VAPROX® HC Sterilant
Persistence and degradability: Hydrogen peroxide in the aquatic environment is subject to various reduction or oxidation processes and decomposes into water and oxygen. Hydrogen peroxide half-life in freshwater ranged from 8 hours to 20 days, in air from 10-20 hours and in soils from minutes to hours depending upon microbiological activity and metal contaminants.

12.3. Bioaccumulative potential

VAPROX® HC Sterilant
Bioaccumulative potential: Not established

Hydrogen peroxide (7722-84-1)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCF fish 1</td>
<td>(no bioaccumulation)</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil
Will likely be mobile in the environment due to its water solubility.

12.5. Results of PBT and vPvB assessment
This product is not considered to be persistent, bioaccumulating nor toxic (PBT).

12.6. Other adverse effects
Decomposes into oxygen and water.
No adverse effects

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations: Empty cartridges may be disposed in normal trash. Expired cartridges should be disposed of according to local policies for hazardous materials. For additional guidance, contact the State Water Board or the Regional Office of the EPA.

Additionnal information: Not applicable

Ecology - waste materials: Decomposes into oxygen and water. No adverse effects.
SECTION 14: Transport information

In accordance with ADR/RID/IMDG/IATA/ADN
Keep well ventilated and away from direct sunlight or heat sources.

14.1. UN number

Applies to PB007 & PB011:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN-No.</td>
<td>2014</td>
</tr>
<tr>
<td>UN-No. (IATA)</td>
<td>2014</td>
</tr>
<tr>
<td>UN-No. (IMDG)</td>
<td>2014</td>
</tr>
<tr>
<td>UN-No. (ADN)</td>
<td>2014</td>
</tr>
</tbody>
</table>

14.2. UN proper shipping name

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name</td>
<td>HYDROGEN PEROXIDE, AQUEOUS SOLUTION</td>
</tr>
<tr>
<td>Proper Shipping Name (IATA)</td>
<td>HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS, 59 %</td>
</tr>
<tr>
<td>Transport document description</td>
<td>UN 2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS 59% STABILIZED, 5.1 (8), II</td>
</tr>
</tbody>
</table>

14.3. Transport hazard class(es)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class (UN)</td>
<td>5.1</td>
</tr>
<tr>
<td>Classification code (UN)</td>
<td>OC1</td>
</tr>
<tr>
<td>Class (IATA)</td>
<td>5.1</td>
</tr>
<tr>
<td>Class (IMDG)</td>
<td>5.1</td>
</tr>
<tr>
<td>Class (ADN)</td>
<td>5.1</td>
</tr>
<tr>
<td>Hazard labels (UN)</td>
<td>5.1, 8</td>
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</table>

14.4. Packing group

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing group (UN)</td>
<td>II</td>
</tr>
</tbody>
</table>

14.5. Environmental hazards

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dangerous for the environment</td>
<td>No</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>No</td>
</tr>
<tr>
<td>Other information</td>
<td>No supplementary information available</td>
</tr>
</tbody>
</table>

14.6. Special precautions for user

14.6.1. Overland transport

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard identification number (Kemler No.)</td>
<td>58</td>
</tr>
<tr>
<td>Classification code (UN)</td>
<td>OC1</td>
</tr>
<tr>
<td>Orange plates</td>
<td>58</td>
</tr>
<tr>
<td>Transport category (ADR)</td>
<td>2</td>
</tr>
<tr>
<td>Tunnel restriction code</td>
<td>E</td>
</tr>
<tr>
<td>Limited quantities (ADR)</td>
<td>1L</td>
</tr>
<tr>
<td>Excepted quantities (ADR)</td>
<td>E2</td>
</tr>
<tr>
<td>EAC code</td>
<td>2P</td>
</tr>
</tbody>
</table>

PB028 & PB012: US and Canada: Ground Modes: Conforms with 49 CFR 173.4a and TDG 1.17.1
International: Ground Modes: Conforms with ADR/RID/ADG7 3.5
VAPROX® HC
Sterilant
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14.6.2. Transport by sea
PB007 & PB011: See above information (IMDG)
PB028 & PB012: IMDG Conforms with IMDG 3.5 Shipping paper must state, “dangerous goods in excepted quantities”

14.6.3. Air transport
PB007 & PB011: Forbidden (US, Canada, International)
PB028 & PB012: Conforms with 49CFR SP A60 (US) Conforms with ICAO SP A75 (International)

14.6.4. Inland waterway transport
VAPROX HC Sterilant is not considered a marine pollutant.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

SECTION 15: Regulatory information
15.1. US Federal Regulations
This product is regulated by the FDA as a medical device.

15.2. US State Regulations
Not applicable.

15.3. Canadian Regulations
The product is regulated by Health Canada as a drug.

SECTION 16: Other information
Revision Date: 07/26/2018
Other information: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 and the Canadian Hazardous Products Regulations (HPR).

Full text of H-phrases:
- Acute Tox. 4 (Inhalation; mist) Acute toxicity (Inhalation; mist), Category 4
- Acute Tox. 4 (Oral) Acute toxicity (Oral), Category 4
- Ox. Liq. 1 Oxidising Liquids, Category 1
- Ox. Liq. 2 Oxidising Liquids, Category 2
- Skin Corr. 1A Skin corrosion/irritation, Category 1A
- Skin Corr. 1B Skin corrosion/irritation, Category 1B
- STOT SE 3 Specific target organ toxicity (single exposure), Category 3
- H271 May cause fire or explosion; strong oxidiser
- H272 May intensify fire; oxidiser
- H302 Harmful if swallowed
- H314 Causes severe skin burns and eye damage
- H332 Harmful if inhaled
- H335 May cause respiratory irritation

SDS GHS
The information on this sheet is not a specification and does not guarantee specific properties. The information is intended to provide general knowledge as to health and safety based upon our knowledge of the handling, storage and use of the product. It is not applicable to unusual or non-standard uses of the product or where instruction or recommendations are not followed.