

As the public navigates the countermeasures to the pandemic, clear information on the viability of both 70% alcohol and alcohol-free hand sanitizers is vital for people to stay safe and healthy.

This paper presents a side-by-side comparison of the science, standards and use cases of both 70% alcohol and alcohol-free hand sanitizers.

This information aims to help consumers make informed decisions on the product(s) they choose to use to protect themselves in the ongoing fight against the virus.

KEY TAKEAWAYS:

- Both 70% alcohol and alcohol-free hand sanitizers are safe and effective in the fight against coronavirus.
- Both 70% alcohol and alcohol-free hand sanitizers have passed identical, independently certified European Standard tests, including tests on skin.
- 70% alcohol hand sanitizer is the World Health Organization (WHO) recommended product and offers a faster virus kill time after application than alcohol-free sanitizer.
- Alcohol-free hand sanitizer offers longer protection against bacteria and viruses, so in certain circumstances where someone is exposed for an extended period, alcohol-free should be considered a superior option.

A COMPARISON BETWEEN ALCOHOL-FREE AND 70% ALCOHOL HAND SANITIZERS

| | Alcohol-free hand sanitizer ¹ | 70% Alcohol hand sanitizer ¹ | Comments on comparison |
|--|--|--|--|
| Effective against | Bacteria and viruses | Bacteria and viruses | - |
| Kill time after application | Bacteria – 1 minute Viruses – 2 minutes | Bacteria – 1 minute Viruses – 1 minute | 70% alcohol sanitizer has a quicker kill time for viruses than alcohol-free sanitizer, however kill time for bacteria is the same. |
| Residual defence against bacteria and viruses after application | Up to 4 hours ² | Up to 2 minutes | Alcohol-free sanitizer offers significantly longer protection against bacteria and viruses than alcohol sanitizer. |
| European Standards | BS EN 1276 ³ BS EN 1500 ⁴ BS EN 14476 ⁵ | BS EN 1276 ³ BS EN 1500 ⁴ BS EN 14476 ⁵ | Both sanitizers are subject to identical, independently certified testing methods, including tests on skin. |
| Halal-certified | Yes - certified by the Halal Monitoring Committee (HMC) | No | - |
| Active substances | Benzalkonium chloride (BKC) and Didecylmethylammonium chloride (DDAC) | Ethanol | Alcohol-free sanitizer is softer on the skin. The active substances do not strip away oils in our skin that retain moisture to the same extent as 70% alcohol sanitizer. |
| WHO-recommended (as of August 2020) | No | Yes | Alcohol is the most widely available antimicrobial chemical, and breweries have been able to satisfy the extra demand caused by coronavirus. 70% alcohol hand sanitizer is also easy to manufacture, helping the supply chain when demand is high. |

1. Cleenol hand sanitizers: Cleenol offer both [70% alcohol and alcohol-free sanitizers](#)

2. Sidney W. Bondurant, Collette M. Duley, John W. Harbell (2019) Demonstrating the persistent antibacterial efficacy of a hand sanitizer containing benzalkonium chloride on human skin at 1, 2, and 4 hours after application. American Journal of Infection Control 47: 928–932

3. BS EN 1276 is a European Standard test method that evaluates the efficacy of a disinfectant against bacteria such as MRSA, *Salmonella typhimurium*, *E. Coli*, *Enterococcus hirae* and *Pseudomonas aeruginosa*.

4. BS EN 1500 is a European Standard test method, required by the NHS, that evaluates the efficacy of a hygienic handrub by measuring the number of viable bacteria remaining on the fingertips of human participants after contamination and handrub exposure

5. BS EN 14476 is a European Standard test method that evaluates the efficacy of a disinfectant against enveloped viruses. Annex A of BS EN 14476 includes coronavirus in the examples of enveloped viruses.

PRODUCT USE GUIDE FOR **SPRAY HAND SANITIZER** **CB121**

Product Description

A fast drying spray hand sanitizer. Ideal for use when entering food production areas or before handling food. An alcohol based product for use in any situation where bactericidal control is important.

Product Features

- Designed for use through the eShield Dispenser.
- Packed in convenient 800ml pouches.
- Passes EN13727 for bacterial activity in 30 seconds at 20°C when used neat. Effective against pseudomonas aeruginosa, Escherichia coli, staphylococcus aureus and enterococcus hirae.
- Complies with EU Cosmetic Products Regulation (EC) No 1223/2009

Direction for Use

- Apply one to two dispenser portions to dry hands and work in thoroughly, paying particular attention to finger nails and cuticles.
- Allow to air dry.
- Rapidly kills bacteria, and a residual bactericide remains on the hands, giving long-term protection.
- Thoroughly rinse the dispenser with warm water, pumping through the nozzle at least once a month to avoid blockage.

Toxicological Information

- This product is formulated from cosmetic grade ingredients and is intended to be applied directly to the skin. If you are allergic to any of its ingredients, do not use this product. If any allergic reactions are suffered, discontinue use of this product immediately and seek medical advice.

Storage

- Store in cool conditions away from direct sources of heat
- Avoid extremes of temperature
- Do not allow to freeze
- Ensure the cap is tightly fitted after use
- Keep out of reach of children

Shelf Life

- Shelf life 30 months, if stored as recommended.
- Refer to product label for further storage details

Environmental

- Do not allow neat liquid to enter surface waterways as serious ecological damage may be caused.
- In the event of a large spillage, contact the local water authority or Environment Agency immediately.
- This product uses recyclable packaging. The detergents used in the formulation are biodegradable to EU guidelines under the detergents regulations (EC) No 648/2004.
- It contains no Phosphates.



Certificate No. 316



Certificate No. E3539

SAFETY DATA SHEET SPRAY HAND SANITIZER

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

1.1. Product identifier

Product name CLEENOL SPRAY HAND SANITIZER

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

Identified uses Disinfectant.

1.3. Details of the supplier of the safety data sheet

Supplier Neville House
Beaumont Road
Banbury
Oxon OX16 1RB
UK
Tel : +44 (0)1295 251721
Fax : +44 (0)1295 269561
sales@cleenol.co.uk

1.4. Emergency telephone number

Emergency telephone Emergency contact number 01295 251721 (9am to 5pm Monday to Friday excluding bank holidays). Ask for Technical Department quoting the product name. Outside of these hours please contact your doctor or local hospital accident and emergency department or the NHS enquiry service (dial 111) quoting product name and present this MSDS advising them that the product is registered with the National Poisons Information Service

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Flam. Liq. 3 - H226

Health hazards Eye Irrit. 2 - H319

Environmental hazards Not Classified

Classification (67/548/EEC or 1999/45/EC) R10.

Human health Vapours and spray/mists in high concentrations are narcotic. Symptoms following overexposure may include the following: Headache. Fatigue. Dizziness. Nausea, vomiting.

Environmental The product is not expected to be hazardous to the environment.

Physicochemical The product is highly flammable. Vapours may form explosive mixtures with air.

2.2. Label elements

Pictogram**Signal word**

Warning

Hazard statements

H226 Flammable liquid and vapour.
H319 Causes serious eye irritation.

Precautionary statements

P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish.
P403+P235 Store in a well-ventilated place. Keep cool.
P501 Dispose of contents/ container in accordance with national regulations.
P102 Keep out of reach of children.
P301+P312 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplementary precautionary statements

P233 Keep container tightly closed.

2.3. Other hazards**Other Hazards**

None

SECTION 3: Composition/information on ingredients**3.2. Mixtures**

| | | |
|-----------------------|--|--|
| ETHANOL | | 60-100% |
| CAS number: 64-17-5 | EC number: 200-578-6 | REACH registration number: 01-2119457610-43-XXXX |
| Classification | Classification (67/548/EEC or 1999/45/EC) | |
| Flam. Liq. 2 - H225 | F;R11 | |
| Eye Irrit. 2 - H319 | | |

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition comments

The data shown are in accordance with the latest EC Directives.

SECTION 4: First aid measures**4.1. Description of first aid measures****General information**

Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Never give anything by mouth to an unconscious person. Get medical attention if any discomfort continues.

Inhalation

Place unconscious person on their side in the recovery position and ensure breathing can take place. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Get medical attention if any discomfort continues.

Ingestion

Rinse mouth thoroughly with water. Give plenty of water to drink. Give milk instead of water if readily available. Keep affected person under observation. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention immediately. Show this Safety Data Sheet to the medical personnel.

Skin contact

Immediately remove contaminated clothing. Rinse immediately with plenty of water. Remove contaminated clothing.

CLEENOL SPRAY HAND SANITIZER

Eye contact Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention promptly if symptoms occur after washing.

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

Inhalation Gas or vapour in high concentrations may irritate the respiratory system.

Ingestion Gastrointestinal symptoms, including upset stomach.

Skin contact Repeated exposure may cause skin dryness or cracking. Irritating to skin.

Eye contact Irritating to eyes. Symptoms following overexposure may include the following: Pain. Redness.

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

Specific treatments Seek medical attention if irritation or symptoms persist. Symptomatic treatment

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Extinguish with the following media: Alcohol-resistant foam. Carbon dioxide (CO₂). Dry chemicals, sand, dolomite etc. Do not use water, if avoidable.

5.2. Special hazards arising from the substance or mixture

Specific hazards The product is highly flammable. Vapours may form explosive mixtures with air. Thermal decomposition or combustion products may include the following substances: Toxic gases or vapours.

5.3. Advice for firefighters

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Environmental precautions Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body. Collect and place in suitable waste disposal containers and seal securely. Label the containers containing waste and contaminated materials and remove from the area as soon as possible.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Keep combustible materials away from spillage. Absorb in vermiculite, dry sand or earth and place into containers. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage.

6.4. Reference to other sections

Reference to other sections See section 3,8 & 13 for further information

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Avoid spilling. Avoid contact with skin and eyes. Do not wear contact lenses. Keep away from heat, sparks and open flame. Static electricity and formation of sparks must be prevented. Use explosion proof electric equipment. Eye wash facilities and emergency shower must be available when handling this product. During application and drying, solvent vapours will be emitted.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep only in the original container.

Storage class Flammable liquid storage.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SHELF LIFE OF DILUTION
12 MONTHS

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Occupational exposure limits

ETHANOL

Long-term exposure limit (8-hour TWA): WEL 1000 ppm 1920 mg/m³

Short-term exposure limit (15-minute): WEL

WEL = Workplace Exposure Limit

Ingredient comments WEL = Workplace Exposure Limits

8.2. Exposure controls

Protective equipment



Appropriate engineering controls Provide adequate general and local exhaust ventilation. Observe any occupational exposure limits for the product or ingredients.

Eye/face protection Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. Personal protective equipment for eye and face protection should comply with European Standard EN166. Contact lenses should not be worn when working with this chemical. The following protection should be worn: Chemical splash goggles.

Hand protection Not Applicable

Other skin and body protection Provide eyewash station and safety shower.

Hygiene measures Promptly remove non-impervious clothing that becomes contaminated. When using do not eat, drink or smoke.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance Coloured liquid.

Colour Blue.

Odour Alcoholic.

| | |
|------------------|--|
| pH | 8-10 |
| Flash point | 23°C PMCC (Pensky-Martens closed cup). |
| Relative density | 0.83 @ 20°C |

9.2. Other information

| | |
|-------------------|-------|
| Other information | None. |
|-------------------|-------|

SECTION 10: Stability and reactivity

10.1. Reactivity

| | |
|------------|--|
| Reactivity | No test data specifically related to reactivity available for this product or its ingredients. |
|------------|--|

10.2. Chemical stability

| | |
|-----------|-----------------------------------|
| Stability | No particular stability concerns. |
|-----------|-----------------------------------|

10.3. Possibility of hazardous reactions

| | |
|------------------------------------|-------------|
| Possibility of hazardous reactions | None known. |
|------------------------------------|-------------|

10.4. Conditions to avoid

| | |
|---------------------|---|
| Conditions to avoid | Avoid heat, flames and other sources of ignition. |
|---------------------|---|

10.5. Incompatible materials

| | |
|--------------------|--|
| Materials to avoid | Keep away from oxidising materials, heat and flames. |
|--------------------|--|

10.6. Hazardous decomposition products

| | |
|----------------------------------|--|
| Hazardous decomposition products | Oxides of carbon. Protection against nuisance dust must be used when the airborne concentration exceeds 10 mg/m ³ . |
|----------------------------------|--|

SECTION 11: Toxicological information

11.1. Information on toxicological effects

| | |
|--------------|--|
| Inhalation | Gas or vapour in high concentrations may irritate the respiratory system. Symptoms following overexposure may include the following: Coughing. |
| Ingestion | Gastrointestinal symptoms, including upset stomach. |
| Skin contact | Repeated exposure may cause skin dryness or cracking. Irritating to skin. |
| Eye contact | Irritating to eyes. Symptoms following overexposure may include the following: Redness. Pain. |

SECTION 12: Ecological Information

| | |
|-------------|---|
| Ecotoxicity | The product is not expected to be hazardous to the environment. |
|-------------|---|

12.1. Toxicity

| | |
|----------|---|
| Toxicity | The product is not believed to present a hazard due to its physical nature. |
|----------|---|

12.2. Persistence and degradability

| | |
|-------------------------------|-------------------------------|
| Persistence and degradability | The product is biodegradable. |
|-------------------------------|-------------------------------|

12.3. Bioaccumulative potential

| | |
|---------------------------|---------------------------------------|
| Bioaccumulative potential | No data available on bioaccumulation. |
|---------------------------|---------------------------------------|

12.4. Mobility in soil

Mobility The product is soluble in water.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects None known.

SECTION 13: Disposal considerations**13.1. Waste treatment methods**

General information Waste should be treated as controlled waste. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

Disposal methods Absorb in vermiculite, dry sand or earth and place into containers. Dispose of waste via a licensed waste disposal contractor. Containers should be thoroughly emptied before disposal because of the risk of an explosion.

SECTION 14: Transport information**14.1. UN number**

UN No. (ADR/RID) 1993

UN No. (IMDG) 1993

UN No. (ICAO) 1993

14.2. UN proper shipping name

Proper shipping name (ADR/RID) FLAMMABLE LIQUID, N.O.S.

Proper shipping name (IMDG) FLAMMABLE LIQUID, N.O.S.

Proper shipping name (ICAO) FLAMMABLE LIQUID, N.O.S.

Proper shipping name (ADN) FLAMMABLE LIQUID, N.O.S.

14.3. Transport hazard class(es)

ADR/RID class 3

ADR/RID label 3

IMDG class 3

ICAO class/division 3

Transport labels**14.4. Packing group**

ADR/RID packing group II

IMDG packing group II

ICAO packing group II

14.5. Environmental hazards**Environmentally hazardous substance/marine pollutant**

No.

14.6. Special precautions for user

EmS F-E, S-E

Emergency Action Code •3YE

Hazard Identification Number 33
(ADR/RID)

Tunnel restriction code (D/E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Not applicable.

Annex II of MARPOL 73/78
and the IBC Code**SECTION 15: Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

National regulations The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No. 716).
EH40/2005 Workplace exposure limits.

EU legislation Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

Guidance CHIP for everyone HSG228.
Workplace Exposure Limits EH40.
Safety Data Sheets for Substances and Preparations

15.2. Chemical safety assessment**SECTION 16: Other information**

Revision date 05/05/2017

Revision 11

Supersedes date 11/01/2017

SDS number CB121/800HS

Risk phrases in full R10 Flammable.
R11 Highly flammable.Hazard statements in full H225 Highly flammable liquid and vapour.
H226 Flammable liquid and vapour.
H319 Causes serious eye irritation.

This 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. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.

PRODUCT USE GUIDE FOR

SENSES ALCOHOL FREE SANITIZER

R14

Product Description

An odourless non-tainting skin sanitizer designed for frequent use
Formulated using predominantly vegetable derived bactericides and foaming agents

Product Features

- Possesses virucidal activity, effective against all enveloped viruses including all **coronaviruses** and **SARS - CoV - 2** within 2 minutes as defined in European test method EN 14476:2013 + A2:2019
- Contains a mixture of effective biocides that quickly eliminate unwanted bacteria on the skin, killing greater than 99.99% of E. coli and 99.999% of MRSA within 1 minute of application
- Complies with the European Suspension Test BSEN1276 killing 99.9% of germs in 30 seconds
- Complies with BSEN 1500 Chemical Disinfectants and Antiseptics – Hygiene Hand rub – Test Method
- Complies with EN13704:2002 and is effective against Clostridium Difficile
- Certified as Halal by the Halal Monitoring Committee
- Complies with BSEN 14476 for effective protection against Ebola virus
- Ideal for use on entering food production areas, or before handling food
- Food safe
- Triclosan Free
- Non-flammable and non-tacky when dry
- Less drying to the skin than alcohol-based products
- Complies with EU Cosmetic Products Regulation (EC) No 1223/2009
- This product has not been tested on animals

Direction for Use

- Apply a small amount to the hands and rub in well, paying particular attention to finger nails and the area between the fingers
- Allow hands to air dry
- Important - the use of towels or tissue may lead to re-contamination with bacteria
- Application to dry cracked or cut skin should be avoided

Toxicological Information

- This product is formulated from cosmetic grade ingredients and is intended to be applied directly to the skin
- If you are allergic to any of its ingredients, do not use this product.
- If any allergic reactions are suffered, discontinue use of this product immediately and seek medical advice



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PRODUCT USE GUIDE FOR

SENSES ALCOHOL FREE SANITIZER

R14

Storage

- Store in cool conditions away from direct sources of heat
- Avoid extremes of temperature
- Do not allow to freeze
- Ensure the cap is tightly fitted after use
- Keep out of reach of children

Shelf Life

- Shelf life 30 months, if stored as recommended. Refer to product label for further storage details

Environmental

- Do not allow large quantities of neat product to enter surface waterways
- This product uses recyclable packaging. The detergents used in the formulation are biodegradable to EU guidelines under the detergents regulations (EC) No 648/2004
- Contains no phosphates
- None of the components of this product are animal derived



Note: This product is only to be used for the purpose for which it was intended and in accordance with the specified instructions. This product should never be mixed with other chemical products and should be handled with care and stored carefully out of reach of children.



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SAFETY DATA SHEET SENSES ALCOHOL FREE SANITIZER

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

1.1. Product identifier

Product name SENSES ALCOHOL FREE SANITIZER

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

Identified uses Cleaning agent.

1.3. Details of the supplier of the safety data sheet

Supplier Neville House
Beaumont Road
Banbury
Oxon OX16 1RB
UK
Tel : +44 (0)1295 251721
Fax : +44 (0)1295 269561
sales@cleenol.co.uk

1.4. Emergency telephone number

Emergency telephone Emergency contact number (9am to 5pm Monday to Friday excluding bank holidays): 01295 251721 ask for technical, quoting the product name.
Emergency Action: In the event of a medical enquiry involving this product outside of these hours, please contact your doctor or local hospital accident and emergency department or the NHS enquiry service (dial 111) again quoting product name and where applicable present this MSDS to the medical professional.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Not Classified

Health hazards Not Classified

Environmental hazards Not Classified

2.2. Label elements

Hazard statements NC Not Classified

Precautionary statements P301+P312 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/ attention.

Contains LAURYL BETAINE

2.3. Other hazards

Other Hazards None

SECTION 3: Composition/information on ingredients**3.2. Mixtures**

| | | |
|--|--|----------------------|
| LAURYL BETAINE | | 1-5% |
| CAS number: 66455-29-6 | | EC number: 266-368-1 |
| Classification | Classification (67/548/EEC or 1999/45/EC) | |
| Skin Irrit. 2 - H315 | Xi;R38,R41. | |
| Eye Dam. 1 - H318 | | |
| DIDECYL DIMETHYLAMMONIUM CHLORIDE | | <1% |
| CAS number: 7173-51-5 | | EC number: 230-525-2 |
| M factor (Acute) = 10 | | |
| Classification | Classification (67/548/EEC or 1999/45/EC) | |
| Met. Corr. 1 - H290 | C;R34 Xn;R22 | |
| Acute Tox. 4 - H302 | | |
| Skin Corr. 1B - H314 | | |
| Eye Dam. 1 - H318 | | |
| Aquatic Acute 1 - H400 | | |
| BENZALKONIUM CHLORIDE | | <1% |
| CAS number: 68424-85-1 | | |
| M factor (Acute) = 10 | M factor (Chronic) = 1 | |
| Classification | Classification (67/548/EEC or 1999/45/EC) | |
| Met. Corr. 1 - H290 | Xn;R21/22. C;R34. N;R50. | |
| Acute Tox. 4 - H312 | | |
| Skin Corr. 1B - H314 | | |
| Eye Dam. 1 - H318 | | |
| Aquatic Acute 1 - H400 | | |
| Aquatic Chronic 1 - H410 | | |

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

SECTION 4: First aid measures**4.1. Description of first aid measures**

| | |
|---------------------|--|
| Ingestion | Rinse mouth thoroughly with water. Get medical attention if any discomfort continues. |
| Skin contact | Remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention if any discomfort continues. |
| Eye contact | Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues. |

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

| | |
|---------------------|------------------------------------|
| Inhalation | May cause respiratory irritation. |
| Ingestion | May cause discomfort if swallowed. |
| Skin contact | May cause skin irritation. |
| Eye contact | May cause eye irritation. |

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

Specific treatments Seek medical attention if irritation or symptoms persist. Symptomatic treatment

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media The product is not flammable. Use fire-extinguishing media suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards Burning may produce irritating, toxic and obnoxious fumes.
Oxides of Carbon, Nitrogen and Sulphur.

5.3. Advice for firefighters

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Environmental precautions Avoid or minimise the creation of any environmental contamination.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Stop leak if possible without risk. Absorb in vermiculite, dry sand or earth and place into containers. Flush contaminated area with plenty of water. Avoid the spillage or runoff entering drains, sewers or watercourses.

6.4. Reference to other sections

Reference to other sections See section 3,8 & 13 for further information

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Avoid contact with eyes.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep only in the original container.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SHELF LIFE OF DILUTION

12 MONTHS

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Occupational exposure limits

CITRIC ACID

Long-term exposure limit (8-hour TWA): 4 mg/m³

Short-term exposure limit (15-minute): 10 mg/m³

CITRIC ACID (CAS: 77-92-9)

Ingredient comments WEL = Workplace Exposure Limits

8.2. Exposure controls**Protective equipment**

| | |
|---------------------------------------|--|
| Eye/face protection | Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. Personal protective equipment for eye and face protection should comply with European Standard EN166. |
| Hand protection | Hand protection not required. |
| Other skin and body protection | Not Required |
| Hygiene measures | Promptly remove any clothing that becomes contaminated. |
| Respiratory protection | Not relevant. |

SECTION 9: Physical and Chemical Properties**9.1. Information on basic physical and chemical properties**

| | |
|--|-------------------|
| Appearance | Liquid. |
| pH | 4-6 |
| Initial boiling point and range | 100°C @ 760 mm Hg |

9.2. Other information

| | |
|--------------------------|-------|
| Other information | None. |
|--------------------------|-------|

SECTION 10: Stability and reactivity**10.1. Reactivity**

| | |
|-------------------|--|
| Reactivity | No test data specifically related to reactivity available for this product or its ingredients. |
|-------------------|--|

10.2. Chemical stability

| | |
|------------------|--|
| Stability | Stable at normal ambient temperatures. |
|------------------|--|

10.3. Possibility of hazardous reactions

| | |
|---|-------------|
| Possibility of hazardous reactions | None known. |
|---|-------------|

10.4. Conditions to avoid

| | |
|----------------------------|---|
| Conditions to avoid | Avoid excessive heat for prolonged periods of time. |
|----------------------------|---|

10.5. Incompatible materials

| | |
|---------------------------|-------------|
| Materials to avoid | None known. |
|---------------------------|-------------|

10.6. Hazardous decomposition products

| | |
|---|--|
| Hazardous decomposition products | Fire creates: Carbon monoxide (CO). Carbon dioxide (CO ₂). |
|---|--|

SECTION 11: Toxicological information**11.1. Information on toxicological effects**

| | |
|---------------------|--|
| Ingestion | May cause discomfort if swallowed. |
| Skin contact | Skin irritation should not occur when used as recommended. |
| Eye contact | Vapour or spray in the eyes may cause irritation and smarting. |

SECTION 12: Ecological Information

Ecotoxicity Not regarded as dangerous for the environment.

12.1. Toxicity

Toxicity The product is not believed to present a hazard due to its physical nature.

12.2. Persistence and degradability

Persistence and degradability The product is biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential Not known.

12.4. Mobility in soil

Mobility The product is soluble in water.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal methods No specific disposal method required.

SECTION 14: Transport information

General The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

No transport warning sign required.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

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

SECTION 15: Regulatory information

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

| | |
|-----------------------------|--|
| National regulations | The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No. 716). |
| EU legislation | Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended). Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended). |
| Guidance | Workplace Exposure Limits EH40. CHIP for everyone HSG228. Approved Classification and Labelling Guide (Sixth edition) L131. Safety Data Sheets for Substances and Preparations |

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information

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|----------------------------------|--|
| Revision date | 17/10/2017 |
| Revision | 11 |
| Supersedes date | 29/09/2017 |
| SDS number | R14 |
| Risk phrases in full | Not classified. R21/22 Harmful in contact with skin and if swallowed. R34 Causes burns. R38 Irritating to skin. R41 Risk of serious damage to eyes. R50 Very toxic to aquatic organisms. |
| Hazard statements in full | H290 May be corrosive to metals. H302 Harmful if swallowed. H312 Harmful in contact with skin. H314 Causes severe skin burns and eye damage. H315 Causes skin irritation. H318 Causes serious eye damage. H400 Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects. |

This 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. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.