SAFETY DATA SHEET

BENZALKONIUM CHLORIDE (BKC 50%)

CAS No.: 8001-54-5

This Safety Data Sheet is issued by Suraj Chemicals as the distributor/supplier of record, based on manufacturer and published GHS / regulatory reference data for this substance. Users should also consult the specific manufacturer's SDS where available.

1. IDENTIFICATION

GHS Product identifier

BENZALKONIUM CHLORIDE (BKC 50%)
Alkyl Dimethyl Benzyl Ammonium Chloride solution; ADBAC 50%
CAS: 8001-54-5

Other means of identification

Not relevant

Recommended use of the chemical and restrictions on use

Relevant uses: Cationic surfactant/quaternary ammonium disinfectant used as a raw material in sanitizer, disinfectant, algaecide and germicidal formulations, fabric softener intermediates, and as a preservative/antimicrobial in industrial formulations. For industrial/formulator use only.

Uses advised against: Not for direct use as a finished disinfectant/biocidal product without appropriate dilution, formulation and regulatory (biocide) registration. All uses not specified in this section or in section 7.3.

Supplier's details

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), based on the well-established hazard profile of Benzalkonium Chloride solutions at approximately 50% concentration:

Acute Tox. 4	Acute oral toxicity, Category 4, H302
Skin Corr. 1B	Skin corrosion, Category 1B, H314
Eye Dam. 1	Serious eye damage, Category 1, H318
Aquatic Acute 1	Hazardous to the aquatic environment, acute hazard, Category 1, H400
Aquatic Chronic 1	Hazardous to the aquatic environment, chronic hazard, Category 1, H410

GHS label elements, including precautionary statements

GHS: Danger

Hazard statements

Acute Tox. 4: H302 – Harmful if swallowed.
Skin Corr. 1B: H314 – Causes severe skin burns and eye damage.
Eye Dam. 1: H318 – Causes serious eye damage.
Aquatic Acute 1: H400 – Very toxic to aquatic life.
Aquatic Chronic 1: H410 – Very toxic to aquatic life with long lasting effects.

Precautionary statements

P260: Do not breathe mist/vapours/spray.
P264: Wash skin/hands thoroughly after handling.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
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.
P305+P351+P338+P310: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.
P310: Immediately call a POISON CENTER or doctor/physician.
P501: Dispose of contents/container in accordance with local regulations on hazardous waste.

Other hazards which do not result in classification

Not relevant

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Chemical description: Benzalkonium Chloride, aqueous solution

In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration (%)
CAS: 8001-54-5	Alkyl Dimethyl Benzyl Ammonium Chloride (Benzalkonium Chloride) – Acute Tox. 4: H302; Skin Corr. 1B: H314; Eye Dam. 1: H318; Aquatic Acute 1: H400; Aquatic Chronic 1: H410 – Danger	48 – 52
CAS: 7732-18-5	Water – Not classified	Balance

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

Mixtures

See composition table above – this product is an aqueous quaternary ammonium surfactant solution (mixture).

4. FIRST AID MEASURES

Description of necessary first-aid measures

Take off immediately all contaminated clothing. Self-protection of the first aider is advised – wear appropriate PPE before assisting.

By inhalation

Remove the person affected to fresh air and keep at rest. Seek immediate medical attention if breathing difficulty or irritation occurs.

By skin contact

Wash immediately and thoroughly with plenty of water for at least 15 minutes. Remove contaminated clothing while rinsing. Seek medical attention.

By eye contact

Flush immediately with plenty of water for at least 15 – 20 minutes, holding eyelids apart. Remove contact lenses if present and easy to do. Seek immediate medical/ophthalmological attention.

By ingestion/aspiration

Do NOT induce vomiting. Rinse mouth with water (only if the person is conscious). Seek immediate medical attention – risk of chemical burns to mouth, throat, oesophagus and stomach.

Most important symptoms/effects, acute and delayed

Skin contact: may cause severe irritation/burns with prolonged or concentrated contact. Eye contact: causes serious eye damage – redness, pain, blurred vision, possible corneal injury. Ingestion: harmful if swallowed; corrosive to mouth, throat and oesophagus at this concentration; nausea, vomiting, abdominal pain. Inhalation of mist: irritation of the respiratory tract, coughing.

Indication of immediate medical attention and special treatment needed, if necessary

Treat symptomatically. Do not attempt to neutralise chemically in the eye or on the skin. Show this SDS to the treating physician.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Suitable: Water spray, foam, dry chemical powder, carbon dioxide (CO_2) – select extinguishing media suited to the surrounding fire.
Unsuitable: None known

Specific hazards arising from the chemical

Aqueous solution – does not burn readily. Not classified as flammable. Thermal decomposition may generate irritant/toxic fumes including hydrogen chloride, oxides of nitrogen and carbon.

Special protective actions for fire-fighters

Fight fire from a safe distance/protected location. Wear self-contained breathing apparatus and full protective clothing when involved in a fire. Cool fire-exposed containers with water spray.

Additional provisions

Do not allow fire-fighting water to enter drains, surface water or ground water – contain and dispose of as contaminated waste.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Wear suitable protective equipment (see Section 8) to prevent contamination of skin, eyes and personal clothing. Note that spilled material may be slippery underfoot.

For emergency responders

Wear protective equipment described in Section 8. Keep unprotected persons away.

Environmental precautions

Keep away from drains, surface water and ground water. Retain and dispose of contaminated washing/rinse water as waste; avoid uncontrolled discharge, as the product will foam and is harmful to aquatic life.

Methods and materials for containment and cleaning up

Contain the spill. Absorb with an inert absorbent material (sand, earth, diatomaceous earth, vermiculite) or flush with plenty of water to a contained/treated effluent system if permitted. Collect with a clean shovel, place in suitable closed containers, and remove for disposal. Wash the affected area thoroughly.

Reference to other sections

See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling

A. General precautions for safe use

Provide adequate ventilation. Avoid contact with skin and eyes. Handle open containers with care – spilled material is slippery.

B. Technical recommendations for the prevention of fires and explosions

Not applicable – product is an aqueous, non-flammable solution. Keep containers tightly closed.

C. Technical recommendations on general occupational hygiene

Do not eat, drink or smoke in work areas. Wash hands and exposed skin before breaks and after work.

D. Technical recommendations to prevent environmental risks

Prevent release to drains, surface water and groundwater. See subsection 6.2.

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Conditions for safe storage, including any incompatibilities

A. Specific storage requirements

Recommended storage temperature	10 – 30°C, protect from freezing and direct sunlight
Container	Keep tightly closed, in original packaging

B. General conditions for storage

Store away from strong oxidising agents, anionic surfactants/detergents (incompatible and mutually inactivating) and strong acids/alkalis. Store in corrosion-resistant (e.g. HDPE, glass-lined, stainless steel) containers, away from food and feed. For additional information see subsection 10.5.

Specific end use(s)

No additional information available beyond the uses listed in Section 1.2.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Benzalkonium Chloride (CAS 8001-54-5): no specific occupational exposure limit established under the Factories Act, 1948 or other Indian regulations.

Appropriate engineering controls

Provide sufficient general/local ventilation as a collective protection measure, in addition to individual PPE as needed.

B. Respiratory protection

Avoid breathing mist/spray. Use a suitable respirator with organic vapour/particulate cartridge if mist is generated in poorly ventilated areas or during spray application.

C. Specific protection for the hands

Wear suitable chemical-resistant gloves (e.g. nitrile or natural rubber, minimum thickness 0.4–0.65 mm).

D. Eye and face protection

Use chemical safety goggles with side protection; wear a face shield where splashing may occur.

E. Bodily protection

Wear suitable protective clothing and chemical-resistant footwear/apron for prolonged or repeated contact.

F. Additional emergency measures

Emergency shower and eyewash stations should be available near the work area.

Environmental exposure controls

Avoid environmental spillage of both the product and its container. See subsection 6.2.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	
Physical state at 20°C	Liquid
Appearance	Clear to pale yellow, viscous/gel-like liquid
Color	Colorless to pale yellow
Odor	Faint, characteristic (mild aromatic)
Odour threshold	Not available
Volatility	
Boiling point at atmospheric pressure	> 100°C (aqueous solution)
Vapour pressure	Approx. that of water at same temperature
Evaporation rate	Not applicable
Product Description	
Density / Relative density at 20°C	Approx. 0.97 – 0.99 g/cm³
Active matter	48 – 52%
pH (1% aqueous solution)	6.0 – 8.0
Vapour density	Not applicable
Partition coefficient n-octanol/water (log KOW)	Not available
Solubility in water	Fully soluble/miscible (forms foam on agitation)
Melting point/freezing point	Not available
Flammability	
Flash Point	Not applicable (aqueous solution)
Flammability (solid, gas)	Non-flammable in solution
Autoignition temperature	Not available
Lower / Upper flammability limit	Not available

** Values are typical/literature values for 50% Benzalkonium Chloride solutions of this class; batch certificates of analysis are available on request.*

Other information

Explosive properties	Not relevant
Oxidising properties	Not relevant
Dynamic viscosity	Viscous liquid; forms gel at low temperature

10. STABILITY AND REACTIVITY

Reactivity

Incompatible with anionic surfactants/detergents (mutual inactivation/precipitation), strong oxidising agents and strong acids/alkalis.

Chemical stability

Stable under normal conditions of storage and handling. May precipitate/gel at low temperature; re-warm and mix gently to redissolve.

Possibility of hazardous reactions

Hazardous polymerisation will not occur.

Conditions to avoid

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Not applicable	Avoid prolonged exposure to high temperature	Not applicable	Avoid freezing

Incompatible materials

Anionic surfactants/detergents, soaps, strong oxidising agents, strong acids and alkalis, and oxidising metal salts.

Hazardous decomposition products

None under normal use and storage conditions. Thermal decomposition may release hydrogen chloride, oxides of nitrogen and oxides of carbon.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

In case of exposure that is repetitive, prolonged, or at concentrations higher than recommended, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect)

Harmful if swallowed. At this concentration, corrosive to the mouth, throat, oesophagus and stomach; may cause nausea, vomiting and abdominal pain.

B. Inhalation (acute effect)

Mist/spray may cause irritation of the nose, throat and respiratory tract; not normally an inhalation hazard for the liquid as supplied.

C. Contact with skin and eyes (acute effect)

Causes severe skin burns. Causes serious eye damage.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity)

Not classified as a germ cell mutagen, carcinogen, or reproductive toxicant based on available data.

E. Sensitizing effects

Not classified as a respiratory sensitiser; skin sensitisation classification criteria not met based on available data, though quaternary ammonium compounds may cause contact dermatitis in sensitive individuals with repeated exposure.

F. Specific target organ toxicity (STOT) – single/repeated exposure

Not classified based on available data.

H. Aspiration hazard

Not classified based on available data.

Product-specific toxicological information (literature values for Benzalkonium Chloride)

Exposure route	Effect rate / concentration	ATE value
Acute Oral (rat)	LD50 (approximate, active substance)	300 – 500 mg/kg
Acute Dermal (rabbit)	LD50	> 1000 mg/kg
Acute Inhalation	LC50	Not established for this grade

Values are literature/typical values for benzalkonium chloride reported in published toxicological reviews; batch-specific data not established.

12. ECOLOGICAL INFORMATION

Very toxic to aquatic life with long lasting effects.

Toxicity

Acute Toxicity	Species	Genus
LC50: < 1 mg/L (96h) – literature range for quaternary ammonium biocides	Freshwater fish	Fish
EC50: < 1 mg/L (48h) – literature range	Daphnia	Crustacean

Persistence and degradability

Biodegradability is limited by the compound's antimicrobial (biocidal) action; not considered readily biodegradable under standard test conditions.

Bioaccumulative potential

Some potential for bioaccumulation in aquatic organisms is reported in the literature for long-chain quaternary ammonium compounds. Not established for this specific grade.

Mobility in soil

Cationic surfactant – strongly adsorbs to soil, sediment and organic matter (low mobility). No further data available.

Results of PBT and vPvB assessment

Not formally assessed for this grade.

Other adverse effects

Toxic to a wide range of micro-organisms, algae and aquatic invertebrates by virtue of its antimicrobial mode of action; avoid any release to sewers/effluent treatment systems relying on biological treatment.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Do not empty into drains; avoid uncontrolled release to the environment. Classified as hazardous waste due to corrosivity and aquatic toxicity at this concentration. Dispose of via a licensed waste disposal contractor in accordance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and applicable local, state and central regulations.

Contaminated packaging should be emptied as completely as possible and may then be handled in the same way as the product; uncleaned packaging should be disposed of as hazardous/industrial waste.

14. TRANSPORT INFORMATION

The classifications below apply to the product as normally supplied (50% aqueous solution). Confirm exact shipping classification/packing group against consignment-specific documentation, as small-pack/limited-quantity provisions may alter the declared transport status.

Transport of dangerous goods by land (ADR 2023 / RID 2023)

14.1 UN number	Not classified as Dangerous Goods in the packaged forms normally supplied by Suraj Chemicals
14.2 UN proper shipping name	Not applicable
14.3 Transport hazard class(es)	Non-applicable for standard packaged supply; bulk shipments may fall under Class 8 (corrosive) – available on request per shipment
14.4 Packing group	Available on request for bulk shipments
14.5 Environmental hazard	Yes (Aquatic Chronic 1)
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant for packaged supply

Transport of dangerous goods by sea (IMDG 41-22)

14.1 UN number	Not classified as Dangerous Goods in the packaged forms normally supplied by Suraj Chemicals
14.2 UN proper shipping name	Not applicable
14.3 Transport hazard class(es)	Available on request for bulk shipments
14.4 Packing group	Available on request for bulk shipments
14.5 Marine pollutant	Yes
14.6 Special precautions for user	Confirm classification with carrier for specific consignment
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant for packaged supply

Transport of dangerous goods by air (IATA/ICAO 2024)

14.1 UN number	Not classified as Dangerous Goods in the packaged forms normally supplied by Suraj Chemicals
14.2 UN proper shipping name	Not applicable
14.3 Transport hazard class(es)	Available on request for bulk shipments
14.4 Packing group	Available on request for bulk shipments
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Confirm classification with carrier for specific consignment
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant for packaged supply

15. REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product. Benzalkonium chloride is used as an active ingredient in disinfectant/sanitizer formulations; end-use biocidal/disinfectant products made from this raw material may require separate registration/approval under applicable Indian biocide and Insecticides Act provisions, as relevant to the finished product.

Other legislation

Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

16. OTHER INFORMATION

Legislation related to safety data sheets

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3

H302: Harmful if swallowed.
H314: Causes severe skin burns and eye damage.
H318: Causes serious eye damage.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources

Well-established public GHS classification and literature toxicological/ecotoxicological data for Benzalkonium Chloride (ADBAC, CAS 8001-54-5) at approximately 50% concentration; no product-specific third-party source PDF was used for this document.

Abbreviations and acronyms

GHS: Globally Harmonized System of Classification and Labelling of Chemicals | ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ATE: Acute Toxicity Estimate | CMR: Carcinogenic, Mutagenic or toxic for Reproduction | STOT: Specific Target Organ Toxicity | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Log Pow: Octanol-water partition coefficient | PBT: Persistent, Bioaccumulative and Toxic | vPvB: Very Persistent and very Bioaccumulative

Disclaimer: The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

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