

**PRECAUTIONARY STATEMENTS
HAZARD TO HUMANS AND DOMESTIC ANIMALS
KEEP OUT OF REACH OF CHILDREN**

DANGER. Corrosive. Causes eye and skin damage. Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Harmful or fatal if swallowed or absorbed through skin. Avoid contamination of food.

FLAMMABLE. Keep away from heat, sparks and open flame. Fire can be contained with water fog, carbon dioxide, sand, or dry chemicals.

ENVIRONMENTAL HAZARD

This pesticide is toxic to fish. Do not discharge into lakes, streams, ponds or public waters unless in accordance with an NPDES permit. Do not apply in marine, and/or estuarine oil fields. For guidance contact your Regional Office of the EPA.

DIRECTIONS FOR USE

For manufacturing use only. See Technical Bulletin 80-10 for additional information.

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

STATEMENT OF PRACTICAL TREATMENT

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. For eyes, call a physician. Remove and wash contaminated clothing before reuse.

If swallowed, drink promptly a large quantity of milk, egg whites, gelatin solution or if these are not available, drink large quantities of water. Avoid alcohol. Call a physician immediately.



300 SOUTH WACKER DRIVE • CHICAGO, ILLINOIS 60606

EPA ESTABLISHMENT NO. 6922
EPA REGISTRATION NO. 6922-10

ARQUAD® B-100

For Use in Formulating
Disinfectants, Sanitizers and Algcides

ACTIVE INGREDIENTS

Alkyl (60% C ₁₄ , 30% C ₁₆ , 5% C ₁₂ , 5% C ₁₈) dimethyl benzyl ammonium chloride	49%
Isopropanol	8%

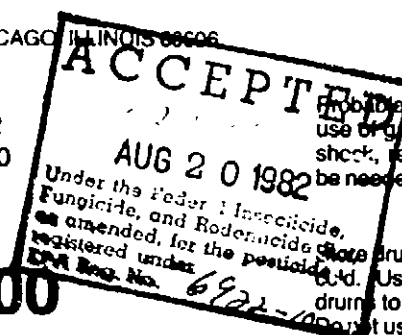
INERT INGREDIENTS

LOT NO.	
NET CONTENTS	8.07 lbs.
GALLONS	per gallon

KEEP OUT OF REACH OF CHILDREN

DANGER

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS



NOTE TO PHYSICIAN

Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed.

STORAGE AND HANDLING

Store drums in a sheltered area away from heat and light. Use approved equipment for transport of drums to avoid puncturing or rupturing of container. Do not use air pressure to transfer.

DISPOSAL

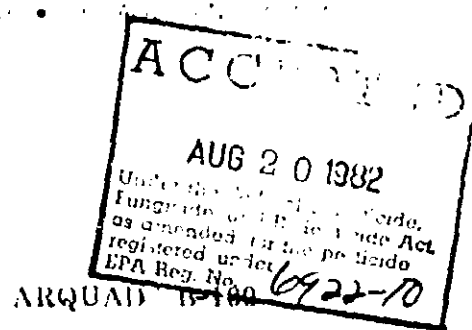
DO NOT REUSE DRUM. Since emptied containers retain residues, all labeled hazard precautions must be observed. Triple rinse (or equivalent) and offer for recycling or reconditioning, or dispose of in a sanitary landfill, or by other approved State and local procedures. OPEN DUMPING IS PROHIBITED.

SPILLAGE

Clean up spills immediately. Small spills can be cleaned up by spreading floor-cleaning compound or other suitable absorbent material on the spill and sweeping up the residue. Larger spills should be flushed to a collection basin for disposal. Clean area well with detergent and water.



EPA Establishment No. 6922
EPA Registration No. 6922-10



Bulletin 80-10

A Disinfectant for Formulating Use

Arquad B-100 is a cationic, surface-active, water-soluble benzylalkylammonium chloride (benzalkonium chloride¹) which exhibits effective microbicidal activity against various organisms such as molds, algae and bacteria.

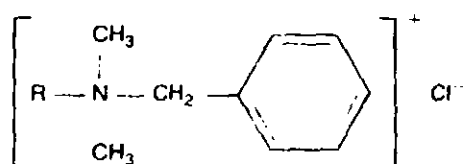
Arquad B-100 may be formulated for use in many industrial applications, such as air wash and recirculated water-heat exchange systems (open or closed), secondary oil recovery, and textile, cosmetic and pharmaceutical manufacture. Its bactericidal activity makes it an effective ingredient in sanitizer formulations used in schools, hospitals and food processing plants. (NOTE: Arquad B-100 is not a food preservative and should not be added directly to food or food products.) Surfaces which have been treated with Arquad B-100 and which will later be in contact with food or food ingredients should be thoroughly rinsed with potable water after treatment. It can also be used to formulate sanitizers for surfaces in swimming pools, locker rooms and washrooms.

Arquad B-100 has FDA clearance for use in sanitizing solutions² for food-processing equipment at 200 ppm concentration. It also is cleared for use as a slimeicide³ in the manufacture of paper and paperboard. Arquad B-100 may be formulated into products for these applications.

Arquad B-100 is registered with the U.S. Environmental Protection Agency (EPA Reg. No. 6922-10) as a disinfectant for formulating use.

PHYSICAL AND CHEMICAL CHARACTERISTICS

Arquad B-100 is a 49% solution of alkyl dimethyl benzyl ammonium chloride or benzalkonium chloride, with alkyl groups derived from fatty acids. The following general structure and alkyl group distribution are characteristic.



R = C₁₂ to C₁₈
C₁₂ (dodecyl), 5%
C₁₄ (tetradecyl), 60%
C₁₆ (hexadecyl), 30%
C₁₈ (octadecyl), 5%

1. CTFA adopted name (for cosmetic labeling).
2. See Code of Federal Regulations, Title 21 — Food and Drugs, §178.1010.
3. See Code of Federal Regulations, Title 21 — Food and Drugs, §176.300.

TABLE 1 -- Composition of Arquad B-100

<u>Active Ingredients</u>	
Alkyl* dimethyl benzyl ammonium chloride (n-alkyl: C ₁₂ -5%; C ₁₄ -60%; C ₁₆ -30%; C ₁₈ -5%)	49%
Isopropanol	8%
<u>Inert Ingredients</u>	43%
<u>Additional Specifications</u>	
Free Amine and Amine Hydrochloride	1% max
Ash	0.5% max
Color, Gardner	2 max
pH (10% in water)	7-8

TABLE 2 -- Typical Properties of Arquad B-100

Physical Form at 25°C	liquid
Specific Gravity at 20°C	0.967
Typical Molecular Weight	380
Flash Point, °F (Pensky-Martens)	90
Cloud Point, °F	0
Pour Point, °F	0

Solubility—Arquad B-100 is freely soluble in acetone, alcohol, most polar solvents, and water; it is slightly soluble in benzene and insoluble in most nonpolar solvents.

Stability—Arquad B-100 is a stable solution. It will maintain its physical, chemical and microbicidal properties over long periods when held under normal conditions.

Compatibility—Arquad B-100 is cationic. It is compatible with many inorganic salts and with nonionic surfactants. It maintains its microbicidal efficacy in hard water (up to 550 ppm hardness calculated as CaCO₃). On the other hand, it is incompatible with anionic surfactants and with sodium metaphosphate and hexa-metaphosphate. Rinse thoroughly to remove such materials before using Arquad B-100 as a microbicide.

pH Effect—Arquad B-100 maintains its microbicidal efficacy over the greater portion of the pH range. It is more effective under alkaline conditions but remains active in acid environments, even below pH 5.0.

Corrosivity—In concentrated form, Arquad B-100 can corrode iron, brass, copper, aluminum, lead and tin. Concentrated Arquad B-100 is inert to polyethylene, natural rubber, stainless steel and Monel metal, and dilute solutions are essentially noncorrosive.

Toxicity—The acute oral LD₅₀ of Arquad B-100 is 354 mg/kg in male rats and 308 mg/kg in female rats. This material is considered toxic by ingestion.

BIOLOGICAL ACTIVITY

Arquad B-100 is highly potent. Its microbiocidal properties result from its structural balance between hydrophilic and hydrophobic groups. This is demonstrated by its ability to alter biological structures such as microbial cell membranes, probably by the destruction of ionic bonds.⁴

EFFICACY AND USE LEVELS

Arquad B-100 is supplied as a concentrated solution for use in formulating sanitizers. Normally such products are further diluted at time of use. Test data indicate that an effective use dilution of Arquad B-100 for control of Staphylococcus aureus and Salmonella choleraesuis is 400 ppm (based on 100% active). Arquad B-100 is algistatic at 2 ppm and algicidal at 3 ppm against Chlorella species. Effective killing dilutions and phenol coefficients for four species of microorganisms are shown in Table 3. Recommended use dilutions are shown in Table 4.

TABLE 3 -- Microbicidal Efficacy of Arquad[®] B-100

Microorganism	Killing Dilution (AOAC)	Phenol Coefficient
<u>Staphylococcus aureus</u>	1:56,000	933
<u>Salmonella typhosa</u> (S. typhi)	1:53,000	594
<u>Escherichia coli</u>	1:31,000	385
<u>Pseudomonas aeruginosa</u>	1:20,000	250

4. Resuggan, J. C. L.: Quaternary Ammonium Compounds in Chemical Sterilisation (London: United Trade Press, Ltd., 1951), pp. 33-34.

TABLE 4 — Recommended Dilutions of Arquad B-100

Prepare 10% solution of Arquad B-100 by dissolving 1 gal of the concentrate (49% active) in 3.75 gal water.

Application	Recommended Use Dilution of Active (Approximate)	Preparation from Arquad B-100 (49% active)	Preparation from 10% Solution
Light Sanitizing Rinse (Dish sanitizing, etc.)	1:5000 (200 ppm)	Add 1 oz to 18.5 gal water	Add 5 oz to 18.5 gal water
Heavy Sanitizing Rinse (Toilets, etc.)	1:2500 (400 ppm)	Add 1 oz to 9.25 gal water	Add 5 oz to 9.25 gal water
Alkalized Sanitary Rinse (Garbage pails, etc.)	1:2500 (400 ppm)	Add 1 oz (+ 1 oz TSP) to 9.25 gal water	Add 5 oz (+ 1 oz TSP) to 9.25 gal water
Mold Growth Control (For walls, floors, e'c.)	1:800 (1250 ppm)	Add 3 oz to 9 gal water	Add 15 oz to 9 gal water
Swimming Pool (Initial charge)	1:400,000 (2.5 ppm)	Add 0.5 gal to 95,000 gal water	Add 2.5 gal to 95,000 gal water
(then each 5-10 days)		1 pt to 95,000 gal water	5 pt to 95,000 gal water
Air Conditioning Systems	1:400,000 (2.5 ppm)	Add 1 oz to 1,500 gal water (add more as needed)	Add 5 oz to 1,500 gal water (add more as needed)
Secondary Oil Recovery (Waterflooding)	1:10,000 (100 ppm)	Add 1 gal to 4,800 gal water	Add 5 gal to 4,800 gal water

TSP = trisodium phosphate (detergent)

AVAILABILITY

Arquad B-100 is shipped in specially lined steel drums holding approximately 390 lb. Bulk shipment is in lithcoate-lined cars or stainless steel tankwagons.

For additional information and samples, contact your Armatk Technical Sales Representative or write or telephone Armatk Company directly at 300 S. Wacker Drive, Chicago, IL 60606, (312) 786-0400.

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For manufacturing use only. Arquad B-100 may be used as an active ingredient in a pesticide formulation, but the formulator must register his end-use product with the EPA as a pesticide. Such registration may require the submission of additional environmental and health impact data, as well as field efficacy data. The formulator, at his own time and expense, must obtain separate registration to sell Arquad B-100 in any formulated product, even if the formulation is a simple dilution with water.

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NOTICE: The technical information and suggestions for use made herein are based on Armak's research and experience and are believed to be reliable, but such information and suggestions do not constitute a warranty, and no patent liability can be assumed. Since Armak has no control over the conditions under which this product is transported, stored, handled, used or applied, it is Armak's intent that its liability on any basis be limited to the price of the product used.

PUBLISHED 7/80
REVISED 11/81