

6922-10



300 S. WACKER DR., CHICAGO, IL 60606

EPA REGISTRATION NO. 6922-10

# ARQUAD® B-100

A DISINFECTANT FOR FORMULATING USE

## ACTIVE INGREDIENTS

n-alkyl(C<sub>12</sub>-5%, C<sub>14</sub>-60%, C<sub>16</sub>-30%, C<sub>18</sub>-5%)  
dimethyl benzyl ammonium chloride . . 50%  
Isopropyl alcohol . . . . . 10%  
Total active ingredients 60%

## INERT INGREDIENTS

Water . . . . . 40%  
Total inert ingredients 40%

FATTY ACIDS • ESTERS • NITROGEN DERIVATIVES

LOT NUMBER

NET CONTENTS

GALLONS

### DANGER:

Keep Out of Reach of Children. Corrosive. Causes eye damage and skin irritation. 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. Avoid contamination of food.

### FIRST AID:

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.


### NOTE TO PHYSICIAN:

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

### DO NOT REUSE DRUM

Return to drum reconditioner or destroy by perforating or crushing and burying in a safe place away from water supplies.

ACCEPTED  
SEP 1 1970  
6922-12

ARMOUR 

ARMOUR INDUSTRIAL CHEMICAL COMPANY

INDUSTRIAL  
CHEMICALS

111 E. WACKER DRIVE  
CHICAGO, ILLINOIS 60601

USDA REGISTRATION NO. 6922-12

FOR FORMULATING USE ONLY  
(SEE TECHNICAL BULLETIN NUMBER 70-3)

# ARQUAD<sup>®</sup> EA 810

50%

## ACTIVE INGREDIENTS

di [n-alkyl (60% C-8, 40% C-10)  
oxypropyl] dimethyl ammonium  
chlorides ..... 50%  
isopropanol ..... 15%  
Total active ingredients 65%

LOT NUMBER

## INERT INGREDIENTS

Water ..... 35%  
Total 100%

NET WT. 390 LBS.

DANGER: KEEP OUT OF REACH OF CHILDREN (SEE WARNING STATEMENTS ON SIDE PANEL)  
USE OF THIS PRODUCT ON FOOD CONTACT SURFACES WILL REQUIRE  
RINSING WITH POTABLE WATER BEFORE CONTACT WITH FOOD

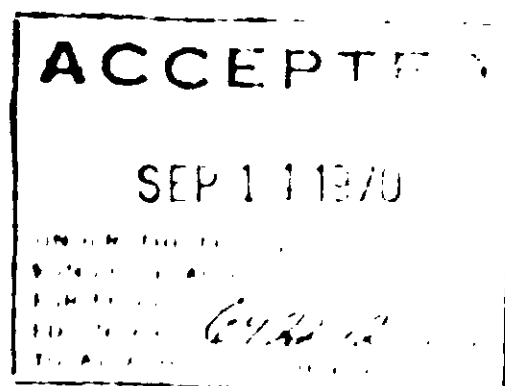
FATTY ACIDS • ESTERS • NITROGEN DERIVATIVES

## DANGER

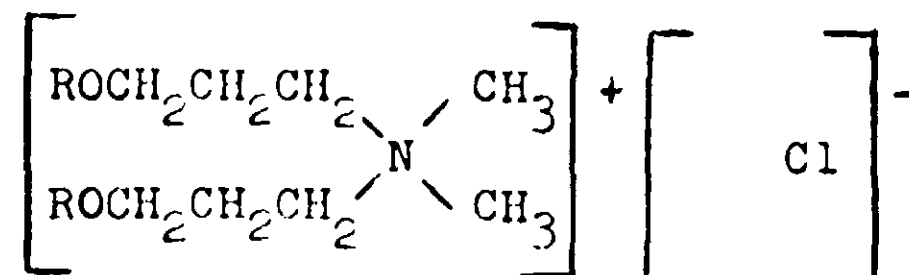
Keep Out of Reach of Children. Causes severe eye and skin damage. Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Harmful or fatal if swallowed or absorbed through skin. Avoid contamination of food.

## FIRST AID

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, do not induce vomiting, drink large quantities of fluid and call a physician immediately.



ARQUAD® EA-810



ARQUAD® EA-810 is the Armour Industrial Chemical Company trademark for a distinctly new type of quaternary ammonium compound. The unique structure of ARQUAD EA-810 is responsible for its effectiveness in waters containing extremely high levels of hardness, as well as its powerful disinfecting, and sanitizing action.

Table 1 - Composition of ARQUAD EA-810

	ARQUAD EA-810	
	50%	80%
Active ingredients		
di-[n-alkyl (60% C-8, 40% C-10) oxypropyl] dimethyl ammonium chlorides	50%	80%
isopropanol	15%	20%
Inert ingredients		
water	35%	
Total	100%	100%

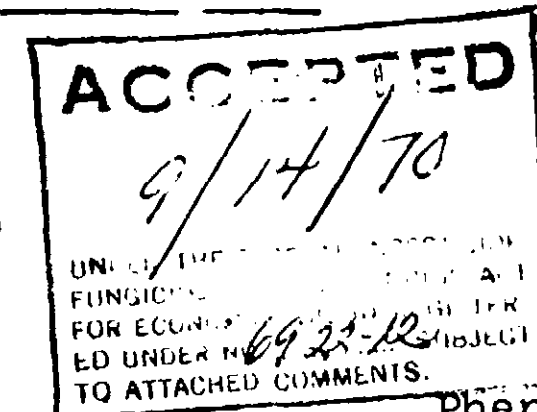
The germicidal properties of this new class of di-(alkyl oxypropyl) dimethyl quaternary ammonium chlorides are dependent upon the length and proportion of the alkyl groups. Research investigations have determined that C 8 and C 10 alkyl groups in a 60:40 proportion exhibit maximal germicidal effectiveness.

BACTERIOLOGICAL PROPERTIES OF ARQUAD EA-810 - ARQUAD EA-810

quaternary is a potent germicide which is relatively non-selective in its effectiveness on virulent microorganisms. ARQUAD EA-810 is especially effective against gram negative organisms such as Salmonella typhosa and Escherichia coli.

Phenol Coefficients\*

Table 2 - Phenol Coefficients  
A.O.A.C. Method at 20°C



<u>Microorganism</u>	<u>ATCC#</u>	<u>Killing Dilution</u>	<u>Phenol</u>	<u>Phenol Coefficient</u>
Salmonella typhosa	6539	1:67,500	1/90	750
Staphylococcus aureus	6538	1:30,000	1/60	500

Hard Water Tolerance\* - The official A.O.A.C. procedure for the determination of hard water tolerance is the method of Chambers. The Chambers' Hard Water Tolerance value is taken as the maximum hardness level at which a 200 ppm concentration of germicide will reduce by 99.999% the test organism in 30 seconds. For ARQUAD EA-810, the Chambers' Hard Water Tolerance value against Escherichia coli is 900.

Use Dilution\* - The official A.O.A.C. use dilution method is applicable for determining the maximum dilutions effective for practical disinfection.

\*NOTE: All dilutions given above, including the phenol coefficients, are based on 100% active ingredients.

Table 3 - A.O.A.C. Use Dilution

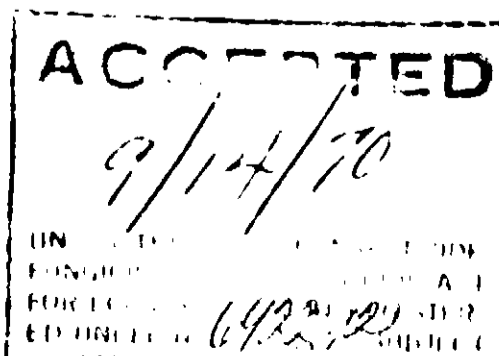
Microorganism	Use Dilution
Salmonella choleraesuis	1-2,500 (400 ppm)
Staphylococcus aureus	1-2,500 (400 ppm)
Pseudomonas aeruginosa	1-1,650 (600 ppm)

CORROSION - ARQUAD EA-810 is no more corrosive to mild steel than tap water and less corrosive than the benzyl-type quaternaries.

TOXICOLOGICAL PROPERTIES OF ARQUAD EA-810 - The toxicological and bacteriological properties of ARQUAD EA-810 quaternary were tested with the following results: The acute oral toxicity LD<sub>50</sub> in white rats was found to be 175 mg/kg. The acute dermal toxicity LD<sub>50</sub> in white rabbits was found to be 630 mg/kg. Sensitization tests run on guinea pigs indicated that ARQUAD EA-810 is essentially non-sensitizing.

APPLICATIONS - ARQUAD EA-810 quaternary has a broad spectrum of germicidal applications. Because of its germicidal effectiveness, ARQUAD EA-810 has use in such applications as sanitizations of food processing plants, dairies and milk plants, egg processing plants, hatcheries, livestock and poultry quarters, laundries, institutions, beverage plants, and hospitals. Disinfecting formulations based on 600 ppm active ARQUAD EA-810 are recommended for hospital use.

ARQUAD EA-810 may be formulated with other materials for a wide variety of applications. As a starting point in formulating



desired products for a given end use, a few suggested formulations are given below:

DETERGENT - SANITIZING AND  
DISINFECTING FORMULATIONS

1. Liquid-Neutral Detergent-Sanitizer

ARQUAD EA-810 (50%)	10.0%	Cleaning-sanitizing-
Triton X-100 (Rohm & Haas)	2.5%	1/2 oz/gal
*Organic Sequestrant	0.2%	Disinfecting dilution-
Water	87.3%	1 oz/gal

2. Liquid-Acid Detergent-Sanitizer

ARQUAD EA-810 (50%)	8.0%	Cleaning-Sanitizing-
Triton X-100 (Rohm & Haas)	5.0%	1/2 oz/gal
H <sub>3</sub> PO <sub>4</sub> (phosphoric acid)	25.0%	Disinfecting dilution
Water	62.0%	1 oz/gal

3. Powdered Alkaline Detergent-Sanitizer

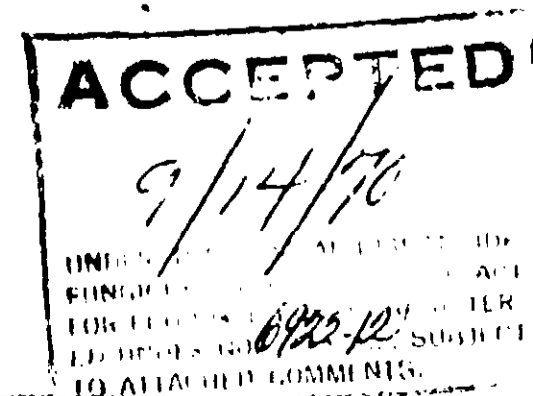
ARQUAD EA-810 (50%)	5.0%	Cleaning-Sanitizing-
Triton X-100 (Rohm & Haas)	5.0%	1 oz/gal
Soda Ash	36.5%	Disinfecting dilution
Trisodium Phosphate	53.5%	2 oz/gal

NOTE: The above are suggested formulations only and are not included in the U.S.D.A. registrations.

Use of this product on food contact surfaces will require rinsing with potable water before contact with food.

BACTERICIDAL COMPATIBILITY - In many detergent-sanitizer and germicidal formulations, 5 to 10% of quaternary compounds are formulated with various other ingredients. The many ingredients used to supplement quaternary ammonium germicides impart various properties -- alkalinity, acidity, reduced surface tension, etc. -- to aqueous solutions in which they are contained. Some

\* Tetrasodium ethylene diamine tetraacetate



Ingredients enhance the bactericidal activity of quaternary germicides, while others leave it relatively unaffected or are even deleterious. Materials which enhance or show no noticeable effect on the germicidal activity of a quaternary ammonium germicide are said to have bactericidal compatibility, while those materials which reduce the killing power of a quaternary ammonium germicide are classified as incompatible. Table 4 lists a group of common supplements used in formulating detergent-sanitizers or germicidal solutions. In each case, germicidal activity of 1 part active ARQUAD EA-810 to 8.5 parts of the additive was determined in a Chambers type test against Escherichia coli ( $100 \times 10^6$  E. coli per ml) in a synthetic hard water solution (400 ppm hardness). The concentration of active ARQUAD EA-810 in the final solution was 200 ppm in each case. Compounds supplementing ARQUAD EA-810 in solutions which showed a killing time equal to or less than that of a 200 ppm solution of ARQUAD EA-810 alone are considered bactericidally compatible (complete kill within 30 seconds). Compounds which gave complete kill between 30 and 60 seconds are classified as borderline, whereas compounds which did not give complete kill within one minute are classified as incompatible. It must be pointed out, however, that almost every compound listed under "incompatible" exhibited complete kill within a 5 minutes period.

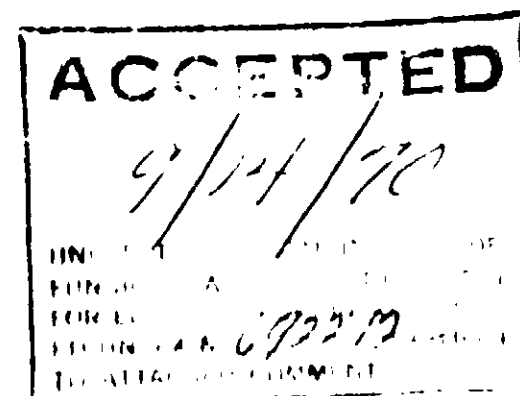


Table 4 - Bactericidal Compatibility

<u>Compatible</u>	<u>Borderline</u>	<u>Incompatible</u>
Borax	Sodium chloride	Ammonium chloride
Boric acid	Sodium gluconate	Anionic detergents
Citric acid	Sodium metasilicate	Disodium hydrogen phosphate
Glycerol	Sodium tripolyphosphate	Monosodium hydrogen phosphate
Na <sub>4</sub> EDTA	Tetrasodium pyrophosphate	Potassium chloride
Na <sub>3</sub> NTA		Soap
Phosphoric acid		Zinc chloride
Sodium aluminate		Zinc sulfate
Sodium nitrite		
Sodium bicarbonate		
Trisodium phosphate		
Urea		

PHYSICAL COMPATIBILITY - The physical appearance of the same solutions as mentioned above after thorough agitation were observed after standing for one hour. The observations are recorded below: The appearance as noted for ARQUAD EA-810 and additives in the hard test waters would not necessarily be representative of their appearance in distilled or deionized water.

Table 5 - Physical Compatibility  
(200 ppm active ARQUAD EA-810;  
1700 ppm additive)

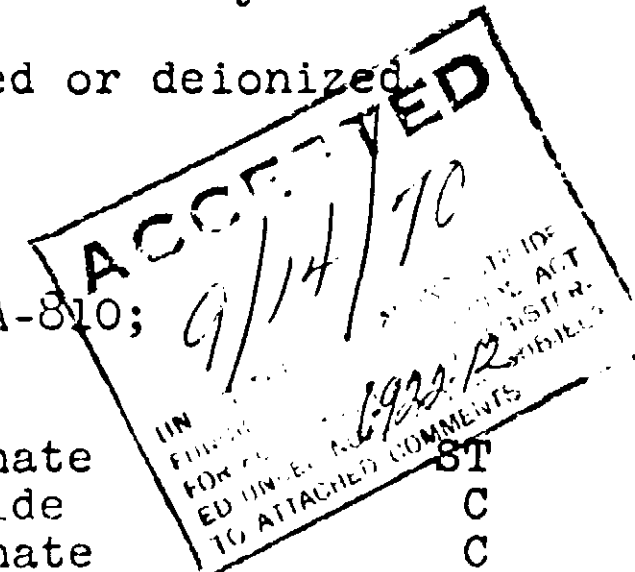
Ammonium chloride	C	Sodium carbonate	ST
Anionic detergents	T	Sodium chloride	C
Borax	CP	Sodium gluconate	C
Citric acid	C	Sodium hexametaphosphate	T
Glycerol	C	Sodium metasilicate	TP
Na <sub>4</sub> EDTA	C	Sodium nitrite	C
Na <sub>3</sub> NTA	C	Sodium tripolyphosphate	TP
Phosphoric acid	C	Tetrasodium pyrophosphate	TP
Potassium chloride	C	Trisodium phosphate	TP
Soap	T	Urea	C
Sodium Aluminate	TP	Zinc chloride	T
Sodium bicarbonate	C		

C = Clear

ST = Slightly turbid T = Turbid

TP = Turbid with precipitate

CP = Clear with precipitate





PHYSICAL AND CHEMICAL PROPERTIES

Table 6 - Product Properties

Percent active quaternary	50%	80%
Molecular weight	444	444
Color, Gardner	2.0 max.	2.0 max.
Specific gravity @ 20°C	0.93-0.95	0.89-0.91
Weight per gal., lbs.	7.75-7.91	7.41-7.58
Flash pt (Cleveland open cup) °F	174	>200
(tag closed cup) °F	168	190
Appearance	Water white to light yellow liquid	

Table 7 - Surface Tension

Concentration ARQUAD EA-810 (% active)	Surface Tension (dynes/cm)
1.0	29.7
0.1	32.0
0.01	33.7
0.001	41.3
Water	71.2

SOLUBILITY - ARQUAD EA-810 quaternary is miscible in all proportions with water, lower alcohols and ketones. The solubility of ARQUAD EA-810 in other common organic solvents is given in the following table:

Table 8 - Solubility Data  
(50% and 80%)

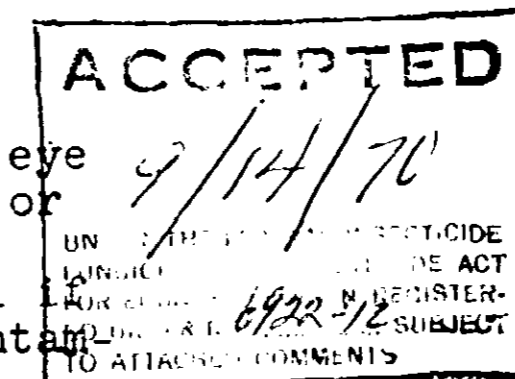
Aromatic hydrocarbons	
benzene	miscible*
toluene	miscible
xylene	miscible
chlorobenzene	miscible
Aliphatic hydrocarbons	
n-hexane	not miscible
iso octane	not miscible
Ethers	
ethyl ether	miscible

\*Miscible: Completely soluble at 1 part product to 1 part solvent

All products which claim to kill or inhibit organisms in any way and are sold interstate must be registered with the U.S.D.A. Such registration is required for compliance with provisions of the Federal Insecticide, Rodenticide, Fungicide Act. To register a product, application must be made on form PR9-199 to the U.S. Department of Agriculture, Pesticides Regulation Division, Washington, D.C., 20250. On request, we will provide written authorization for the U.S.D.A. to consider anything we have on file which may assist in obtaining approval of such applications.

DANGER

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