

HITOR

GERMICIDAL DETERGENT

- Disinfects, Cleans, Deodorizes
- Pleasant fragrance • Economical to use

Product Number 102714

PSEUDOMONACIDAL STAPHYLOCIDAL *VIRUCIDAL FUNGICIDAL

Hi-Tor is a concentrated multi-purpose germicidal detergent proven effective by the AOAC Use-Dilution Method in 400 ppm hard water (Calculated as CaCO3) in the presence of organic bioload (Fetal Bovine Serum). Refer to the HI-TOR Research Bulletin for testing details.

Hi-Tor's superior powerful formula disinfects, cleans, and deodorizes in one labor saving step. Hi-Tor is effective against the following pathogenic organisms:

- | | | | |
|------------------------|-------------------------|--------------------------------|------------------------|
| Pseudomonas aeruginosa | Salmonella choleraesuis | Staphylococcus aureus | *Adenovirus Type 2 |
| Enterobacter aerogenes | Enterobacter cloacae | Staphylococcus aureus phage 80 | *Herpes Simplex Type 1 |
| Escherichia coli | Klebsiella pneumoniae | Staphylococcus aureus phage 81 | *Influenza Type A/Mich |
| Proteus mirabilis | Proteus vulgaris | Staphylococcus epidermidis | *Vaccinia |
| Shigella flexneri | Shigella sonnei | Streptococcus pyogenes | *Adenovirus Type 4 |
| | Serratia marcescens | | *Herpes Simplex Type 2 |
| | | Trichophyton mentagrophytes | Candida albicans |

- *Rubella
- *Avian Infectious Bronchitis
- *Avian Influenza A/Mich
- *Bovine Parvovirus
- *Infectious Bovine Rhinotracheitis

ACCEPTED

AUG 09 1985

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 303-91

"Classified by Underwriters Laboratories Inc.® as to electrical conductivity when used on conductive floors and spontaneous heating. Hi-Tor for use with listed electrically conductive flooring of the vinyl type." 378Y

DILUTIONS: 1 to 256 **ONE-HALF OUNCE PER GALLON**

DIRECTIONS FOR USE GENERAL CLASSIFICATION

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

GENERAL USE DIRECTIONS

USES: Floors, walls, metal surfaces, painted surfaces, exterior bowl surfaces, empty basins, showers, conductive flooring, and lavatory fixtures. For institutional use only such as in hospitals and nursing homes, schools and colleges, medical and dental offices, and veterinary clinics.

APPLICATION: Use 1/2 ounce of Hi-Tor per gallon of water for a minimum contact time of 10 minutes in a single application. For disinfecting, remove gross filth and heavy soil deposits, then thoroughly wet surfaces. Hi-Tor is extremely versatile and can be applied with a mop, sponge, or cloth as well as soaking. The recommended use solution is used once and discarded. Rinsing is not necessary on floor surfaces unless floors are to be waxed or polished.

ACTIVE INGREDIENTS: Didecyl dimethyl ammonium chloride 9.22

n-Alkyl (C14 50%, C12 40%, C16 10%) dimethyl benzyl ammonium chloride 6.14

INERT INGREDIENTS 84.64

DANGER: KEEP OUT OF REACH OF CHILDREN. ONLY FOR SALE TO, USE, AND STORAGE BY SERVICE PERSONS.

STATEMENT OF PRACTICAL TREATMENT

In case of skin contact, wash thoroughly with soap and water. In case of eye contact, immediately flush eyes with water for 15 minutes and get prompt medical attention. 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.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

Corrosive. Concentrate causes eye and skin damage. May be absorbed through the skin. Do not get in eyes, on skin or clothing. Wear goggles or face shield and rubber gloves when handling. Wash thoroughly with soap and water after handling. Remove and wash contaminated clothing before reuse. Harmful if swallowed. Avoid contamination of food, water or feed.

STORAGE AND DISPOSAL

PROHIBITIONS

Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. Do not reuse empty container.

PESTICIDE DISPOSAL

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL

PLASTIC CONTAINERS

Triple rinse (or equivalent), then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

GENERAL

Consult federal, state, or local disposal authorities for approved alternative procedures such as limited open burning.

EPA Reg. No. 303-91 EPA Est. No. 303-IN-1, PA-1
(See shoulder or bottom of container for plant identification number)

HI-TOR

GERMICIDAL DETERGENT

DILUTION 1:256 (½ OUNCE PER GALLON)

**BACTERICIDAL
FUNGICIDAL
VIRUCIDAL***

ACCEPTED

AUG 09 1985

Under the Federal Insecticide,
Fungicide, and Rodenticide Act,
as amended, for the pesticide
registered under
EPA Reg. No. 303-91

In addition to its cleaning and deodorizing capabilities, Hi-Tor's high powered formula allows it to be efficacious against a wide spectrum of both gram-positive and gram-negative bacteria as well as other potential disease-causing organisms such as fungi and viruses in the presence of 400 ppm hard water (calculated as CaCO₃) and 5% organic bioload simultaneously. This unique formula has been tested and the results revealed that Hi-Tor can disinfect, clean, and deodorize in one labor saving step in 400 ppm hard water (calculated as CaCO₃) and 5% organic bioload.

E.P.A. Reg. No. 303-91

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HI-TOR GERMICIDAL DETERGENT

BACTERICIDAL: Pseudomonas aeruginosa Staphylococcus aureus
 Salmonella choleraesuis Staphylococcus aureus phage 80
 Enterobacter aerogenes Staphylococcus aureus phage 81
 Enterobacter cloacae Staphylococcus epidermidis
 Escherichia coli Streptococcus pyogenes
 Klebsiella pneumoniae Shigella flexneri
 Serratia marcescens Shigella sonnei
 Proteus mirabilis
 Proteus vulgaris

FUNGICIDAL: Trichophyton mentagrophytes Candida albicans
VIRUCIDAL: Adenovirus Type 2 Avian Infectious Bronchitis
 Adenovirus Type 4 Avian Influenza Type A/Duck/Mich
 Herpes Simplex Type 1 Bovine Parvovirus
 Herpes Simplex Type 2 Infectious Bovine Rhinotracheitis
 Influenza Type A/Mich
 Rubella
 Vaccinia

DISINFECTS: HI-TOR has a blend of active ingredients for broad spectrum disinfection.

CLEANS: HI-TOR's special combination of synthetic detergents and builders provides excellent cleaning properties.

DEODORIZES: HI-TOR destroys most odor-causing bacteria, eliminating odors at their source.

LABOR SAVING: HI-TOR's combination of ingredients means cleaning and disinfecting can be accomplished in one easy labor saving step.

STABILITY: Stable for a period of not less than 1 year from the date of manufacture.

FLASH POINT: None to boiling

FRAGRANCE: Lemon-Pine

COLOR: Clear fluorescent yellow

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ACTIVE		
INGREDIENTS:	didecyl dimethyl ammonium chloride.....	9.22%
	n-alkyl (C ₁₄ 50%, C ₁₂ 40%, C ₁₆ 10%) dimethyl benzyl ammonium chlorides..	6.14%
INERT		
INGREDIENTS:	84.64%
TOTAL:	100.00%

TESTING INFORMATION

The A.O.A.C. Use-Dilution Method was used to demonstrate the bactericidal properties of Hi-Tor. The basic test was modified in accordance with E.P.A. Pesticide Assessment Guidelines (Subdivision G, Section 91-30, Recommended Method No. 2) to include 400 ppm synthetic hard water as the diluent for Hi-Tor and 5% Fetal Bovine Serum (Whittaker M.A. Bioproducts, 14-501-A) as the 5% organic bioload added to the respective test inocula.

Through the years some products tested by the A.O.A.C. Use-Dilution Method have produced unexplained variable test results ^{1, 2, 3} especially with the test organism Pseudomonas aeruginosa.⁴ The addition of the 5% ⁵ organic bioload appears to accentuate the test variability.

In May, 1983, representatives of A.O.A.C., E.P.A., C.S.M.A., state government laboratories, independent laboratories, and academia met and formed an A.O.A.C. Use-Dilution Task Force, charged with the responsibility of improving and documenting the precision and accuracy of the A.O.A.C. Use-Dilution Method. ^{6, 7, 8, 9} Huntington Laboratories, Inc. is a participant in the A.O.A.C. Use-Dilution Method Task Force and welcomes the opportunity to discuss the activities of the Task Force.

TESTING INFORMATION CONT.

Given the foregoing concerns about test variability, further laboratory testing of Hi-Tor should replicate the specially modified A.O.A.C. Use-Dilution Method as used to generate the data presented in this Research Bulletin.

Specific Details for the A.O.A.C. Use-Dilution Method as Used to Generate the Data Presented in this Research Bulletin

Summary of the A.O.A.C. Use-Dilution Confirmation Method. Official Methods of Analysis. 14th Edition. 1984. A.O.A.C. Chapter 4. Modified to include 400 ppm synthetic hard water as the test product diluent and 5% organic bioload added to the respective test inocula.

I. ORGANISM

- A. Culture Media. All test bacteria are propagated in nutrient broth (4.001).
- B. Phenol Resistance for each of the three (3) required test bacteria is determined (4.001-4.006).
- C. 5% Organic Bioload. One (1.0) ml of FETAL BOVINE SERUM is added to 19.0 ml of the respective test organism nutrient broth suspension.
- D. Contaminated Dried Carriers. Clean, sterile, stainless steel penicylinders are immersed in the test inocula (step C above) for 15 minutes at room temperature. After the 15 minutes, the wet, contaminated carriers are placed upright on a double layer of sterile filter paper in a sterile petri dish. This Petri dish is placed in an incubator set at 37°C for 30 minutes to allow the contaminated carriers to dry.

All carriers are polished stainless steel cylinders 8± 1 mm od, 6± mm id, length 10± 1 mm, of type 304 stainless steel, SS18-8. (Obtainable from S&L Metal Products Corp., 58-29 57 Drive, Maspeth, NY 11378).

All new carriers are inspected for surface imperfections and general polished appearance. New carriers may yield atypical test responses. Cylinders are screened for uniformity of response by the use-dilution test. All new cylinders, which give positive responses when tested with Staphylococcus aureus against 500 ppm solution of alkyl dimethyl ammonium chloride, alkyl chain distribution of C₁₄ 50%, C₁₂ 40%, and C₁₆ 10% are discarded.

- E. Survival Density of Organisms from Dried Carriers. A contaminated dried carrier (step D above) is transferred to a test tube containing 10 ml phosphate buffer dilution water (4.020f). This test tube then is shaken 25 times in a one foot arc to dislodge the organisms from the carrier. Further tenfold serial dilutions through 10⁻⁴ are made and 1.0 aliquots of the appropriate dilutions are plated using the Pour-Plate Method and Standard Methods Agar. All plates are incubated at 27°C for 48 hours, and then the Colony Forming Units (CFU) are counted with the aid of a Quebec Colony Counter. All determinations are performed in duplicate. The average CRU/carrier is reported.

II. PRODUCT

TESTING INFORMATION CONT.

- A. Diluent. 400 ppm CaCO_3 -EQUIVALENT synthetic hard water is prepared according to 4.024 and tested according to 4.025.
- B. Dilution: The test product is diluted 1:256 with the 400 ppm synthetic hard water described above.
- C. Temperature. Test tubes, each containing 10 ml of the diluted test product (step B above), are placed in a water bath at 20°C for at least 15 minutes before use.

III. THE TEST

A contaminated dried carrier, described in I.D above, is added aseptically to a test tube of 10 ml of the diluted test product in II.C above. The test tube with the carrier is returned to the 20°C water bath for exactly 10 minutes.

IV. INCUBATION - RESULTS

- A. Recovery Media. After exactly 10 minutes (step III above), the carrier is removed from the diluted test product with a sterile needle and transferred to a test tube containing 10 ml of Letheen Broth 4.001 (d) (3).
- B. Incubation. All recovery tubes (step IV A) are incubated at 37°C for 48 hours.
- C. Results. After the 48 hour incubation period, each recovery tube is examined visually for turbidity. If the tube appears turbid, it is recorded as growth (+); if the tube appears clear, it is recorded as no growth (-).

V. NEUTRALIZATION CONTROL

- A. Product. 0.25 ml of the diluted test product (step II, B above) is added to a test tube containing 10 ml of Letheen Broth.
- B. Organism. The nutrient broth culture is diluted with phosphate buffer dilution water (4.020f) to achieve a cell density of approximately 10^7 CFU/ml. One (1.0) ml of this cell suspension is added to the test tube prepared in step V.A; this results in a final cell density of approximately 10^7 CFU/ml in the neutralization control tube. (All cell densities are confirmed by Standard Plate Count Methods).
- C. Incubation. The inoculated test tube in step V.B is incubated at 37°C for 48 hours.
- D. Results. After the 48 hour incubation period, the neutralization control tube is examined visually for turbidity (growth). This tube must show growth (+) (i.e., be turbid) for the test to be considered valid.

**HI-TOR IS PSEUDOMONACIDAL
IN THE PRESENCE OF 400 PPM HARD WATER (CALCULATED AS CaCO₃) AND 5% ORGANIC BIOLOAD**

Various dilutions of HI-TOR were tested against Pseudomonas aeruginosa using the A.O.A.C. Use-Dilution Method modified to include 400 ppm synthetic hard water (calculated as CaCO₃) as the diluent for HI-TOR and 5% Fetal Bovine Serum as the organic bioload added to the Pseudomonas test inoculum.

- PRODUCT:** HI-TOR at various dilutions
TEST METHOD: A.O.A.C. Use-Dilution Confirmation Test, modified to include 400 ppm synthetic hard water (calculated as CaCO₃) and 5% organic bioload (Fetal Bovine Serum).
RECOVERY MEDIUM: Lethen Broth
ORGANISM: Pseudomonas aeruginosa ATCC #15442
RESULTS:

Hi-Tor Dilution	Quat Conc. in Test Soln. (PPM)	Plate Counts (CFU/Carrier)	# Tubes Tested	# Tubes Showing Growth
1:768	200	3.5x10 ⁶	60	58
1:614	250	3.5x10 ⁶	60	30
1:512	300	3.5x10 ⁶	60	14
1:439	350	3.2x10 ⁶	60	9
1:384	400	3.2x10 ⁶	60	5
1:341	450	3.2x10 ⁶	60	0
1:307	500	4.0x10 ⁶	60	0
1:279	550	4.0x10 ⁶	60	0
1:256	600	4.0x10 ⁶	60	0

The "Official Methods of Analysis" of the Association of Analytical Chemists; Edited by Sidney William; Fourteenth Edition, 1984; Chapter 4, Disinfectants; Use-Dilution Methods 4.009, page 68 states:

"Max. diln. of germicide which kills test organism on 10 carriers in 10 min. interval represents presumed max. safe use-diln. for practical disinfection."

According to the A.O.A.C. criterion for the 'presumed max. safe use-dilution for practical disinfection', HI-TOR could be diluted as much as 1:341 with 400 ppm hard water (450 ppm quat in use-dilution) and be presumed a safe use-diln. for practical cleaning/disinfection of environmental surfaces contaminated with organic soil and Pseudomonas aeruginosa. However, the HI-TOR label states that HI-TOR is to be diluted 1:256 or ½ oz. per gallon water (600 ppm quat in use-dilution); this provides 35% more active quat in use-dilution than presumed the minimum required for practical disinfection by the A.O.A.C. standard.

**HI-TOR® IS BACTERICIDAL
PSEUDOMONACIDAL, SALMONELLACIDAL, STAPHYLOCIDAL
IN THE PRESENCE OF 400 PPM HARD WATER (CALCULATED AS CaCO₃)
AND 5% ORGANIC BIOLOAD**

When tested according to the Use-Dilution Confirmation Test as outlined in the current edition of the A.O.A.C., HI-TOR was shown to be bactericidal against the representative gram-positive organism, *Staphylococcus aureus*; the representative gram-negative organism, *Salmonella choleraesuis*; and, the representative hospital pathogen, *Pseudomonas aeruginosa*.

PRODUCT: HI-TOR diluted 1:256

TEST METHOD: A.O.A.C. Use-Dilution Confirmation Test, modified in the presence of 400 ppm synthetic hard water (calculated as CaCO₃) and 5% organic bioload (Fetal Bovine Serum).

RECOVERY MEDIUM: Lethen Broth

ORGANISMS: *Staphylococcus aureus* ATCC #6538
Pseudomonas aeruginosa ATCC #15442
Salmonella choleraesuis ATCC #10708

RESULTS:

Sample	<i>Staphylococcus aureus</i>		<i>Pseudomonas aeruginosa</i>		<i>Salmonella choleraesuis</i>	
	# tubes tested	# tubes with growth	# tubes tested	# tubes with growth	# tubes tested	# tubes with growth
A	60	0	60	0	60	0
B	60	0	60	0	60	0
C 60 days old	60	0	60	0	60	0
Phenol Resistance	1:60		1:80		1:90	
Neutralization Control	+		+		+	
Plate Counts (CFU/Carrier)	1.8x10 ⁶		3.8x10 ⁶		8.7x10 ⁵	

CONCLUSION: HI-TOR is bactericidal in 400 ppm hard water (calculated as CaCO₃) and 5% organic bioload against the hospital pathogens *Pseudomonas aeruginosa*, *Salmonella choleraesuis*, and *Staphylococcus aureus* at 1:256 (½ ounce/gallon). Thus HI-TOR meets the criteria for use as a hospital germicide.

HI-TOR KILLS ANTIBIOTIC RESISTANT STAPH

Antibiotic resistant strains of Staph aureus can pose problems in hospitals. Proper use of HI-TOR can help reduce the hazard of cross contamination by reducing the numbers of resistant Staph found in the hospital environment.

PRODUCT: HI-TOR diluted 1:256

TEST METHOD: A.O.A.C. Use-Dilution Confirmation Test, modified in the presence of 400 ppm synthetic hard water (calculated CaCO₃) and 5% organic bioload (Fetal Bovine Serum).

RECOVERY MEDIUM: Lethen Broth

ORGANISMS: *Staphylococcus aureus* — phage 80
Staphylococcus aureus — phage 81

RESULTS:

Sample	<i>Staphylococcus aureus</i> phage 80		<i>Staphylococcus aureus</i> phage 81	
	# tubes tested	# tubes showing growth	# tubes tested	# tubes showing growth
Sample	20	0	20	0
Neutralization Control	+		+	
Plate Counts (CFU/Carrier)	9.8x10 ⁵		5.5x10 ⁵	

CONCLUSION: HI-TOR kills resistant Staph at 1:256, (½ ounce/gallon) in the presence of 400 ppm hard water (calculated as CaCO₃) and 5% organic bioload (Fetal Bovine

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EFFECTS OF SOLUTION BACTERICIDAL ACTIVITY AGAINST GRAM-POSITIVE AND GRAM-NEGATIVE ORGANISMS

To demonstrate HI-TOR's broad spectrum activity, HI-TOR was tested against a wide range of bacteria which are pathogenic to man.

PRODUCT: HI-TOR diluted 1:256

TEST METHOD: A.O.A.C. Use-Dilution Confirmation Test, modified in the presence of 400 ppm synthetic hard water (calculated as CaCO₃) and 5% organic bioload (Fetal Bovine Serum).

RECOVERY MEDIUM: Lethen Broth

RESULTS:

Gram-Positive Bacteria	Plate Counts (CFU/Carrier)	# tubes tested	# tubes showing growth
<i>Staphylococcus aureus</i>	1.8x10 ⁶	180	0
<i>Staphylococcus aureus</i> Phage 80	9.8x10 ⁵	20	0
<i>Staphylococcus aureus</i> Phage 81	5.5x10 ⁵	20	0
<i>Streptococcus pyogenes</i>	2.8x10 ⁵	20	0
<i>Staphylococcus epidermidis</i>	1.4x10 ⁶	20	0
Neutralization Control		+	

Gram-Negative Bacteria	Plate Counts (CFU/Carrier)	# tubes tested	# tubes showing growth
<i>Pseudomonas aeruginosa</i>	3.8x10 ⁶	180	0
<i>Salmonella choleraesuis</i>	8.7x10 ⁵	180	0
<i>Enterobacter cloacae</i>	2.0x10 ⁶	20	0
<i>Proteus vulgaris</i>	4.5x10 ⁵	20	0
<i>Serratia marcescens</i>	3.6x10 ⁵	20	0
<i>Proteus mirabilis</i>	1.9x10 ⁶	20	0
<i>Klebsiella pneumoniae</i>	6.7x10 ⁵	20	0
<i>Escherichia coli</i>	1.1x10 ⁶	20	0
<i>Shigella sonnei</i>	4.8x10 ⁵	20	0
<i>Shigella flexneri</i>	1.9x10 ⁶	20	0
<i>Enterobacter aerogenes</i>	4.6x10 ⁶	20	0
Neutralization Control		+	

CONCLUSION: HI-TOR is effective at 1:256 dilution, (1/2 ounce/gallon) against a broad range of gram-positive and gram-negative hospital pathogens in the presence of 400 ppm hard water (calculated as CaCO₃) and 5% organic bioload (Fetal Bovine Serum).

HI-TOR IS FUNGICIDAL

HI-TOR was tested for effectiveness against the chosen representative pathogenic fungus, Trichophyton mentagrophytes, a causative agent of athlete's foot, and Candida albicans, which causes infections of the mouth, skin, hands, lungs, and other organs, by the A.O.A.C. Fungicidal Test.

PRODUCT: HI-TOR diluted 1:256

TEST METHOD: A.O.A.C. Fungicidal Test, modified in the presence of 400 ppm synthetic hard water (calculated as CaCO₃) and 5% organic bioload (Fetal Bovine Serum).

ORGANISM: Trichophyton mentagrophytes ATCC #9533
Candida albicans ATCC #10231

RESULTS:

Organism	Plate Counts (CFU/Carrier)	# tubes tested	# tubes showing growth
Trichophyton mentagrophytes	2.3x10 ⁶	20	0
Candida albicans	1.4x10 ⁶	20	0
Neutralization		+	

CONCLUSION: HI-TOR is an effective fungicide at 1:256, (1/2 ounce/gallon) in the presence of 400 ppm hard water (calculated as CaCO₃) and 5% organic bioload (Fetal Bovine Serum).

HI-TOR IS VIRUCIDAL

To simulate in-use conditions, 5% Fetal Bovine Serum (the organic bioload) was added to each virus culture; stainless steel penicylinders were immersed in the virus-organic bioload suspensions for 15 minutes; the penicylinders were removed and dried for 30 minutes at 37°C. Then the contaminated, dried penicylinders were immersed in HI-TOR (diluted 1:256 with 400 ppm synthetic hard water calculated as CaCO₃) for 10 minutes at 20°C. The product must demonstrate complete inactivation of the virus. When cytotoxicity is observed in the titer assay system, at least a 3-log reduction in the titer assay must be demonstrated.

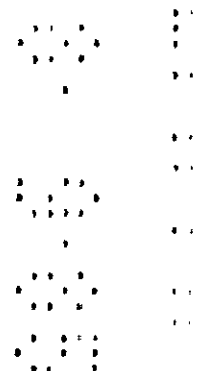
PRODUCT: HI-TOR diluted 1:256 with 400 ppm synthetic hard water (calculated as CaCO₃)

RESULTS:

Viral Family	Contains DNA or RNA	Virus plus 5% Fetal Bovine Serum	Titer Reduction
Adenoviridae	DNA	Adenovirus Type 2	5.5 log
Adenoviridae	DNA	Adenovirus Type 4	4.5 log
Herpesviridae	DNA	Herpes Simplex Type 1	6.5 log
Herpesviridae	DNA	Herpes Simplex Type 2	6.0 log
Orthomyxoviridae	RNA	Influenza Type A/Michigan	8.0 log
Togaviridae	RNA	Rubella	5.5 log
Poxviridae	DNA	Vaccinia	6.0 log
Coronaviridae	RNA	Avian Infectious Bronchitis	7.3 log
Orthomyxoviridae	RNA	Avian Influenza Type A/Michigan	7.5 log
Parvoviridae	DNA	Bovine Parvovirus	5.5 log
Herpesviridae	DNA	Infectious Bovine Rhinotracheitis	6.0 log

Neutralization controls = positive

CONCLUSION: HI-TOR, diluted 1:256 (½ ounce per gallon) with 400 ppm hard water (calculated as CaCO₃), is VIRUCIDAL to a wide range of VIRUSES contaminated with a 5% organic bioload (Fetal Bovine Serum).



SHIPPING AND STORAGE SUGGESTIONS

HI-TOR is not permanently damaged by freezing; however, avoid freezing if possible. If HI-TOR is frozen, allow it to warm to room temperature and agitate mildly before using.

DIRECTIONS FOR USE

HI-TOR cleans, deodorizes and disinfects in one step. It may be used for cleaning and disinfecting all washable hard non-porous surfaces such as floors, walls, woodwork, bathroom fixtures, equipment and furniture. HI-TOR is used to clean and disinfect glass, chrome, stainless steel, other metal surfaces, porcelain, tile, washable painted or varnished surfaces, as well as resilient tile or terrazzo floors.

Add ½ ounce (15 cc) HI-TOR to each measured gallon of water and mix. Apply solution by normal means such as mop, sponge, cloth or brush. Thoroughly wet all surfaces to be cleaned then remove excess solution with wrung out applicator. Treated surfaces should remain wet for 10 minutes. For disinfecting heavily soiled areas, remove gross filth first. Discard solution when it becomes dirty and replace with fresh solution. Use only as directed.

SAFE HANDLING RECOMMENDATIONS

HI-TOR concentrate is corrosive, it causes eye damage and skin irritation. Do not get in eyes, on skin or clothing. For added protection, wear protective eye shields and gloves; wash thoroughly with soap and water after handling the concentrate.

In case of skin contact, wash thoroughly with soap and water. For eyes, flush with water for 15 minutes and get prompt medical attention. 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. Remove and wash contaminated clothing before reuse.

The HI-TOR 1:256 use solution is not considered toxic nor is it classified as corrosive to the skin or eyes. The use solution may cause mild or slight irritation to some people. The use of a good grade of rubber gloves is recommended when using HI-TOR use solutions for cleaning by hand. It is good practice to wash thoroughly with soap and water when the cleaning/disinfecting task is finished.

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 **Huntington**®

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10/82

HI-TOR[®]

germidical detergent

For Hospital Use
Disinfects — Cleans — Deodorizes

HI-TOR is BACTERICIDAL (tested against 16 different pathogenic bacteria including Pseudomonas and Staph.), FUNGICIDAL (tested against 2 representative fungi) and VIRUCIDAL (tested against 11 viruses including Herpes Simplex Types 1 and 2, Adenum Types 2 and 4, Influenza A/Michigan Rubella, Vaccinia and 4 other viruses pathogenic to animals) in the presence of 5% organic bioload and 400 ppm hard water (calculated as CaCO₃) simultaneously. HI-TOR is to be used only on hard, non-porous, inanimate environmental surfaces.

DILUTION: 1 to 256 ½ ounce per gallon

Suggested Uses	Gallon Dilution	Applications
general cleaning & disinfecting	½ ounce	spray, mop sponge or soak
damp mopping floors	½ ounce	mop
conductive floors	½ ounce	mop or spray and pickup
furniture	½ ounce	sponge or cloth
walls	½ ounce	sponge
nursing stations	½ ounce	according to need and use
laboratory equipment	½ ounce	according to need and use
stainless steel	½ ounce	sponge
rubber products	½ ounce	stiff brush or sponge
laboratory fixtures	½ ounce	brush or sponge
disposal equipment	½ ounce	stiff brush or sponge
safety equipment	½ ounce	stiff brush or sponge
bathrooms	½ ounce	mop floors, wipe walls and fixtures
mattress covers	½ ounce	wipe with sponge or cloth
toilet seats	½ ounce	wipe with sponge, rinse

NOTE: The prescribed contact time is a minimum of 10 minutes in a single application. For disinfecting heavily soiled areas, remove gross filth and soil deposits, then thoroughly wet surfaces. The recommended use solution is used once and discarded.

EPA Reg. No. 303-91



Huntington Laboratories, Inc., Huntington, IN 46758 • Lansdale, PA 19446 • Dallas, TX 75227 • Oakland, CA 94621 • Brambleton, VA 22031

HI-TOR[®]

Detergente Anti-bacterial

Para Uso En Hospitales

Desinfecta — Limpia — Desodoriza

HI-TOR es BACTERICIDA (probado contra 16 diferentes bacterias patógenicas incluyendo *Seudomonas* y *Estafilococos*), FUNGICIDA (probado contra 2 hongos representativos) y VIRUCIDA (probado contra 11 virus incluyendo Herpes Simple Tipos 1 y 2, Adenum Tipos 2 y 4, Influenza A/Michigan, Rubella, Vaccinia y otros 4 virus patógenicos a animales) en la presencia del 5% biocarga orgánica y 400 ppm agua cruda (calculada como CaCO₃) simultáneamente.

HI-TOR deberá ser usado únicamente en superficies ambientales duras, no porosas e inanimadas.

DILUCION: 1 a 256 ½ onza por galón

Usos Recomendados	Dilucion per Galon	Aplicaciones
limpieza y desinfección general	½ onza	rocear, limpiar con esponja o enjuagar
trapeando pisos con traperos humedos	½ onza	trapear
pisos conductivos	½ onza	trapear o rocear y recoger
muebles	½ onza	esponja o trapo
paredes	½ onza	esponja
estaciones de enfermeras	½ onza	de acuerdo con necesidad y uso
equipo de laboratorio	½ onza	de acuerdo con necesidad y uso
hierro cromado	½ onza	esponja
productos plásticos	½ onza	cepillo fuerte o esponja
accesorios de laboratorio	½ onza	cepillo o esponja
equipo de disposición	½ onza	cepillo duro o esponja
equipo de seguridad	½ onza	cepillo duro o esponja
baños	½ onza	trapeado de pisos, limpieza de paredes y accesorios
cubiertas de colchones	½ onza	limpiar con esponja o trapo
sillas del retrete	½ onza	limpiar con esponja o trapo

NOTA: El tiempo de contacto prescrito es un minimo de 10 minutos en un sola aplicación. Para desinfectar áreas demasiado sucias, remover la suciedad, depósitos de tierra luego mojar las superficies a fondo. La solución de uso recomendado se usa una vez y se descarta.

EPA Reg. No. 303-91

Pat. Pend.

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★

HI-TOR PAT
PENO

germicidal detergent

EPA REG. NO. 303-91

Procedures for General Hospital Use

The standard use-dilution for germicidal cleaning with Hi-Tor germicidal detergent is a 1:256 solution. Equivalent measures are 1/8 ounce per gallon, 6 ounces per standard 12-gallon mopping tank or 3 ounces per 6-gallon bucket of water. The prescribed contact time is a minimum of 10 minutes in a single application. For disinfecting heavily soiled areas, remove gross filth and soil deposits, then thoroughly wet surfaces. The recommended use solution is used once and discarded. Rinsing is not necessary unless floors are to be waxed or polished.

1. Hi-Tor will be used in the general housecleaning of the hospital.
2. Administrative offices and admitting offices, medical records library, laboratory department, pharmacy, x-ray department, visitor lounges and lobby areas should be damp mopped with Hi-Tor solution daily.
3. Main lobby, main corridor, wing corridors and emergency rooms should be damp mopped with Hi-Tor solution early in the morning.
4. All patient rooms should be damp mopped with Hi-Tor solution daily.
5. All bathrooms, wash bowls and fixtures in patient rooms and baths should be wiped thoroughly with Hi-Tor solution daily.

6. Public bathrooms and locker rooms should be cleaned thoroughly with Hi-Tor solution daily. The floors and fixtures should be mopped or wiped down with Hi-Tor solution twice daily.
7. The dietary department should be cleaned thoroughly. Floors should be damp mopped with Hi-Tor solution daily. Food carts are to be wiped down with Hi-Tor solution. Avoid contamination of food. Clean and disinfect garbage cans and adjacent areas with Hi-Tor.
8. All other areas not mentioned should be damp mopped once daily.
9. Mops used for Hi-Tor solution should be clean for each day's use and not used for any other purpose.
10. Isolation areas are to be flooded or mopped daily with Hi-Tor solution and equipment and fixtures disinfected as directed by department heads responsible.

Hi-Tor's one-step action disinfects and cleans in 400 ppm hard water (calculated as CaCO_3) and 5% organic serum simultaneously.

Hi-Tor has been proven effective against 11 gram negative and 5 gram positive bacteria, 2 fungi and 11 viruses including Herpes Simplex Types 1 and 2, Adenovirus Types 2 and 4, Influenza A/Michigan, Rubella, Vaccinia and 4 other viruses pathogenic to animals.

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HI-TOR PAT
PENDING
germicidal detergent

EPA REG. NO. 303-91

Procedures for Operating Suite

The standard use-dilution for germicidal cleaning with Hi-Tor is a 1:256 solution. Equivalent measures are ½ ounce per gallon, 6 ounces per standard 12-gallon mopping tank or 3 ounces per 6-gallon bucket of water. The prescribed contact time is a minimum of 10 minutes in a single application. For disinfecting heavily soiled areas, remove gross filth and soil deposits, then thoroughly wet surfaces. The recommended use solution is used once and discarded. Rinsing is not necessary unless floors are to be waxed or polished.

1. Hi-Tor will be used in the housecleaning of the entire operating suite including equipment at all times.
2. Equipment, such as operating tables, instrument tables, basins, racks and lights will be wiped down daily with Hi-Tor solution, more often when necessary.
3. Floors are to be thoroughly cleaned with Hi-Tor solution after each operation.

4. Walls of operating rooms should be wiped down with Hi-Tor solution weekly unless conditions warrant the use of Hi-Tor solution more often.
5. The operating suite shall be thoroughly cleaned with Hi-Tor solution once each week.
6. Conductive floors shall be machine scrubbed once a week using Hi-Tor solution (using ½ ounce Hi-Tor per gallon of water). If possible, pick up with vacuum, then rinse with standard Hi-Tor solution.
7. Mops used for Hi-Tor solution shall be clean for each day's use and not used for other purposes.

Hi-Tor's one-step action disinfects and cleans in 400 ppm hard water (calculated as CaCO_3) and 5% organic serum simultaneously.

Hi-Tor has been proven effective against 11 gram negative and 5 gram positive bacteria, 2 fungi and 11 viruses including Herpes Simplex Types 1 and 2, Adenovirus Types 2 and 4, Influenza A/Michigan, Rubella, Vaccinia and 4 other viruses pathogenic to animals.

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HI-TOR PAT
PENO
germicidal detergent
EPA REG. NO. 303-91

Procedures for Delivery Room Suite

The standard use-dilution for germicidal cleaning with Hi-Tor is a 1:256 solution. Equivalent measures are ½ ounce per gallon, 6 ounces per standard 12-gallon mopping tank or 3 ounces per 6-gallon bucket of water. The prescribed contact time is a minimum of 10 minutes in a single application. For disinfecting heavily soiled areas, remove gross filth and soil deposits, then thoroughly wet surfaces. The recommended use solution is used once and discarded. Rinsing is not necessary unless floors are to be waxed or polished.

1. Hi-Tor solution will be used in the house-cleaning of the entire delivery room suite.
2. Floors in the delivery room should be cleaned thoroughly with Hi-Tor solution after each delivery.
3. All equipment, such as delivery tables, instrument tables, basins, racks and lights should be wiped down daily with Hi-Tor solution.
4. Walls of delivery room are to be wiped down every other day with Hi-Tor solution.
5. Labor rooms, locker rooms and delivery suite corridors should be damp mopped with Hi-

Tor solution daily, more often when necessary.

6. Beds, chairs and other equipment in the delivery suite are to be wiped down with Hi-Tor solution twice a week.
7. All walls and floors in the delivery rooms should be cleaned once each week with Hi-Tor solution, more often when necessary.
8. Walls of the delivery suite other than the delivery room should be wiped with Hi-Tor solution once each week.
9. Conductive floors shall be machine scrubbed once a week with Hi-Tor (using ½ ounce per gallon of water — heavy soil may require more Hi-Tor), and then rinse with standard Hi-Tor solution.
10. Mops used for Hi-Tor solution should be clean for each day's use and not used for other purposes.

Hi-Tor's one-step action disinfects and cleans in 400 ppm hard water (calculated as CaCO_3) and 5% organic serum simultaneously.

Hi-Tor has been proven effective against 11 gram negative and 5 gram positive bacteria, 2 fungi and 11 viruses including Herpes Simplex Types 1 and 2, Adenovirus Types 2 and 4, Influenza A/Michigan, Rubella, Vaccinia and 4 other viruses pathogenic to animals.

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HI-TOR PAT
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germicidal detergent

EPA REG. NO. 303-91

Procedures for Terminal Cleaning of Isolation Room

The standard use-dilution for germicidal cleaning with Hi-Tor is a 1:256 solution. Equivalent measures are ½ ounce per gallon, 6 ounces per standard 12-gallon mopping tank or 3 ounces per 6-gallon bucket of water. The prescribed contact time is a minimum of 10 minutes in a single application. For disinfecting heavily soiled areas, remove gross filth and soil deposits, then thoroughly wet surfaces. The recommended use solution is used once and discarded. Rinsing is not necessary unless floors are to be waxed or polished.

1. When notified that an isolation room has been vacated, collect supplies and equipment necessary for cleaning the room.
2. Follow all required precautions for personal protection such as gowns, masks and proper hand washing.
3. Mix a solution of Hi-Tor (½ oz. per gallon) and, with the solution, clean all horizontal surfaces of:
 - a. bed
 - b. overbed table
 - c. bedside cabinets
 - d. bedside lamp
 - e. chairs

4. Clean thoroughly:
 - a. windows
 - b. venetian blinds
 - c. mattress cover & pillow cover
 - d. chairs
5. Wash with Hi-Tor solution (½ oz. per gallon) anything else in the room which has a horizontal surface. Change solution as required at any point in the cleaning.
6. Wash with Hi-Tor solution (½ oz. per gallon) any area in the room which shows any visible amount of soil or possible prior contamination.
7. Mop floor with clean mop and Hi-Tor solution (½ oz. per gallon).
8. Clean equipment used and return to proper storage area.

Hi-Tor's one-step action disinfects and cleans in 400 ppm hard water (calculated as CaCO_3) and 5% organic serum simultaneously.

Hi-Tor has been proven effective against 11 gram negative and 5 gram positive bacteria, 2 fungi and 11 viruses including Herpes Simplex Types 1 and 2, Adenovirus Types 2 and 4, Influenza A/Michigan, Rubella, Vaccinia and 4 other viruses pathogenic to animals.

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HI-TOR PAT
PEND
germicidal detergent

EPA REG. NO. 303-91

Procedures for Use in Nursery

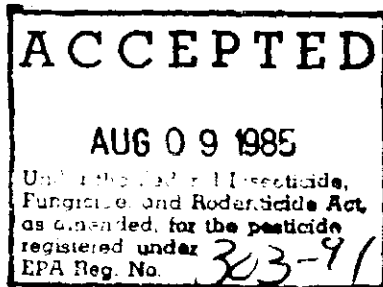
The standard use-dilution for germicidal cleaning with Hi-Tor is a 1:256 solution. Equivalent measures are 1/4 ounce per gallon, 6 ounces per standard 12 gallon mopping tank or 3 ounces per 6-gallon bucket of water. The prescribed contact time is a minimum of 10 minutes in a single application. For disinfecting heavily soiled areas, remove gross filth and soil deposits, then thoroughly wet surfaces. The recommended use solution is used once and discarded. Rinsing is not necessary unless floors are to be waxed or polished.

1. Hi-Tor will be used in the housecleaning of the nursery.
2. Floors shall be cleaned thoroughly with Hi-Tor solution at least once daily.

3. Bassinets, scales and other equipment should be wiped down thoroughly once daily. Surfaces that come into contact with babies should be wiped dry with a clean cloth or rinsed.
4. Walls, windows and equipment are to be wiped down thoroughly with Hi-Tor solution each month or more often when needed.
5. Mops used for Hi-Tor solution should be clean for each day's use and not used for other purposes.

Hi-Tor's one-step action disinfects and cleans in 400 ppm hard water (calculated as CaCO_3) and 5% organic serum simultaneously.

Hi-Tor has been proven effective against 11 gram negative and 5 gram positive bacteria, 2 fungi and 11 viruses including Herpes Simplex Types 1 and 2, Adenovirus Types 2 and 4, Influenza A/Michigan, Rubella, Vaccinia and 4 other viruses pathogenic to animals.



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b-164, Hgn. Lab., Hi-Tor Sales, 002 c, megaron

Hi-Tor[®] A 1st Class Performer

*revised
7.10.85*

FOR INFECTION CONTROL

Huntington Laboratories, a leader in germicide research, has formulated a powerful combination of two quaternary ammonium chlorides in a highly concentrated detergent system. The result — Hi-Tor.

Hi-Tor's powerful formula delivers a 1st class performance to help you in your critical infection control responsibilities.

HELPS IN INFECTION CONTROL

Hi-Tor's excellent cleaner coupled with the powerful twin chain/FMB 1210 quaternary ammonium chlorides provides you with a potent germicide. Hi-Tor destroys hospital pathogens on inanimate environmental surfaces which can cause nosocomial infections.

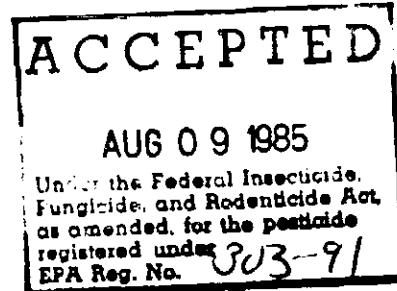
ADDITIONAL TESTING

Hi-Tor meets the minimum requirements by proving effectiveness against Pseudomonas, Staphylococcus, and Salmonella. For demonstrating a wider spectrum of activity, Hi-Tor has been proven effective against an additional 13 pathogenic bacteria, including 2 antibiotic resistant strains of Staph — Hi-Tor also controls 11 viruses and 2 fungi. This additional testing in the presence of 400 ppm hard water (calculated as CaCO₃) and 5% organic serum provides further evidence of Hi-Tor's effectiveness as a broad spectrum one-step disinfectant.

PROVEN EFFECTIVE UNDER SOIL LOADS

Historically, quat efficacy has been questioned under soil loads. Hi-Tor has solved this problem. Hi-Tor has proven to be a highly effective germicidal detergent under extreme conditions of a combination of 400 ppm hard water (calculated as CaCO₃) and a 5% organic bioload using A.O.A.C. test procedures.

Now you can disinfect and clean your most critical care areas in one step with Hi-Tor — a proven hospital germicidal detergent.



1/3

EDUCATION PROGRAMS

The finest products are only as good as the people who use them.

To assist you in the difficult and time consuming task of training, Huntington provides a complete set of educational and training programs.

Huntington's Professional Sales Representatives are available for personalized in-service programs.

Film strips teaching various housekeeping tasks are available in English and Spanish.

Wall Cards are available in English and Spanish to assist in the proper use of Hi-Tor.

Procedures for cleaning and disinfecting the Operating Suite, Delivery Room Suite, Isolation Room, the Nursery and other areas are available.

Technical Product Information

Description

Hi-Tor is a Quaternary ammonium germicidal detergent for use as a general disinfectant cleaner on hard, non-porous, inanimate objects.

Hi-Tor is proven effective against the following hospital pathogens in 400 ppm hard water (calculated as CaCO₃) and 5% organic bioload simultaneously as determined by the appropriate official A.O.A.C. Test methods modified to conform with EPA guidelines.

Gram-Negative Bacteria

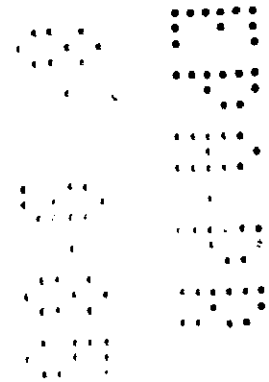
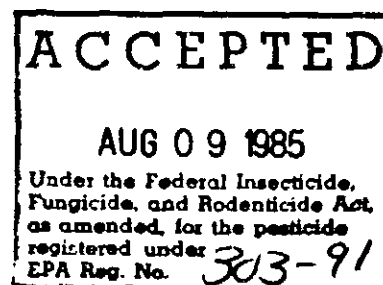
Pseudomonas aeruginosa ATCC 15442
Salmonella choleraesuis ATCC 10708
Enterobacter aerogenes ATCC 13048
Enterobacter cloacae ATCC 27508
Escherichia coli ATCC 11229
Klebsiella pneumoniae ATCC 4352
Proteus mirabilis ATCC 9921
Proteus vulgaris ATCC 8472
Serratia marcescens ATCC 29633
Shigella flexneri ATCC 25929
Shigella sonnei ATCC 20930

Gram-Positive Bacteria

Staphylococcus aureus ATCC 6538
Staphylococcus aureus phage 80 ATCC 14154
Staphylococcus aureus phage 81 ATCC 14154
Staphylococcus epidermidis ATCC 17917
Streptococcus pyogenes clinical

VIRUSES

Adenovirus Type 2
Adenovirus Type 4
Herpes Simplex, Type 1
Herpes Simplex, Type 2
Influenza, Type A/Michigan
Rubella
Vaccinia
Avian Infectious Bronchitis
Avian Influenza, Type A
Bovine Parvovirus



479/800

EFFECTIVE IN CRITICAL AREAS

Hi-Tor can be used in the Operating Suite, Delivery Room, Isolation Room, Nursery, Burn Unit and Trauma Units. All areas of the hospital can be disinfected, cleaned and deodorized quickly with one product — Hi-Tor.

EFFECTIVE CLEANING AND DISINFECTING

Hi-Tor is active and effective in a combination of hard water (400 ppm calculated CaCO_3) and organic soils. Now you can clean more areas with confidence.

FOR HOUSEKEEPING

EASE OF USE

Hi-Tor is conveniently packaged in easy-to-handle 1 gallon containers. Available proportioning systems provide economical and accurate dilution.

A simple self-contained ½ ounce pump provides a controlled method for accurate measurement.

The attractive, theft-proof Liqualator cabinet provides an accurate proportioning system for two 1 gallon containers.

A Handi-Grip spray bottle labeled specifically for Hi-Tor enables the staff to work with a ready-to-use identifiable product.

HI-TOR A 1ST CLASS PERFORMER

SAFETY

Hi-Tor containers have easy-to-read directions and have been color coded to provide ready identification.

Hi-Tor does not have a flash point.

DEODORIZES

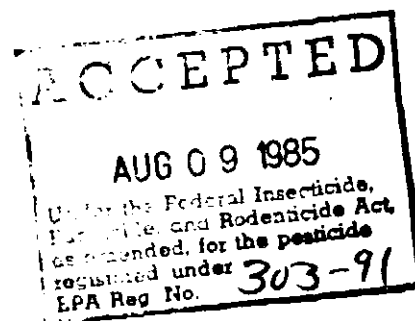
Hi-Tor's simultaneous action kills odor causing germs while it cleans and disinfects. Its lemon-pine fragrance leaves a fresh clean scent that both patients and staff appreciate.

HI-TOR IS ECONOMICAL

At ½ ounce per gallon (1.256) Hi-Tor makes 256 gallons of solution that disinfects, cleans and deodorizes in all areas when you need it.

CLEANS EASILY WITH NO RINSING

Hi-Tor's one step application easily disinfects and cleans floors, walls, lavatory and patient room fixtures and other inanimate environmental surfaces. The rinsing of floors is not necessary unless the surface is to be waxed or polished.



FUNGI

Trichophyton mentagrophytes ATCC 9533

Candida albicans ATCC 10231

PROPERTIES

Active ingredients

didecyl dimethyl ammonium chloride..... 9.22%

n-Al yl dimethyl benzyl ammonium chloride..... 6.14%

DILUTION

1:256 — ½ ounce per gallon of water shall dilute clear and be effective in hard or soft water.

SIMULTANEOUS ACTION

Diluted product effective in 400 ppm hard water (calculated as CaCO₃) and 5% organic bioload simultaneously by the appropriate A.O.A.C. Methods modified to conform with EPA guidelines.

STABILITY

Concentrated product shall remain stable for a period of not less than one year from date of manufacture when stored under normal conditions.

PHYSICAL CHARACTERISTICS

Appearance..... Yellow

Odor..... Lemon-Pine

Typical pH Concentrate..... 12.2

Typical pH at 1:256..... 10.0

Clarity, 1:256 Use-Solution

In deionized or distilled water..... Clear

In tap water to 400 ppm hardness..... Clear

Specific Gravity @ 25°C..... 1.01

Pounds/gallon @ 25°C..... 8.42 lbs.

Dispersibility..... soluble in water

Flammability..... no flash point to boil (212°F)
tag closed cup

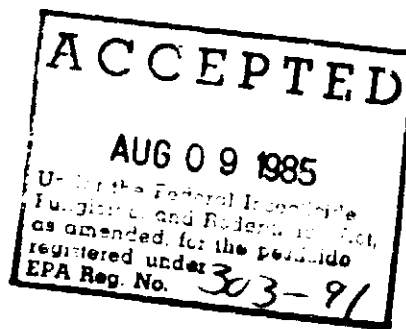
CONVENIENT PACKAGING

Container: 1 gallon — six per case

5 gallon container

EPA Reg. No. 303-91

Product Number 102714



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Oakland, CA 94621 415/430 2800 • Bramalea, Ontario, Canada L6T 1E3 416/677-2401

Huntington

ACCEPTED

Huntington

HI-TOR®

AUG 09 1985

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 303-91

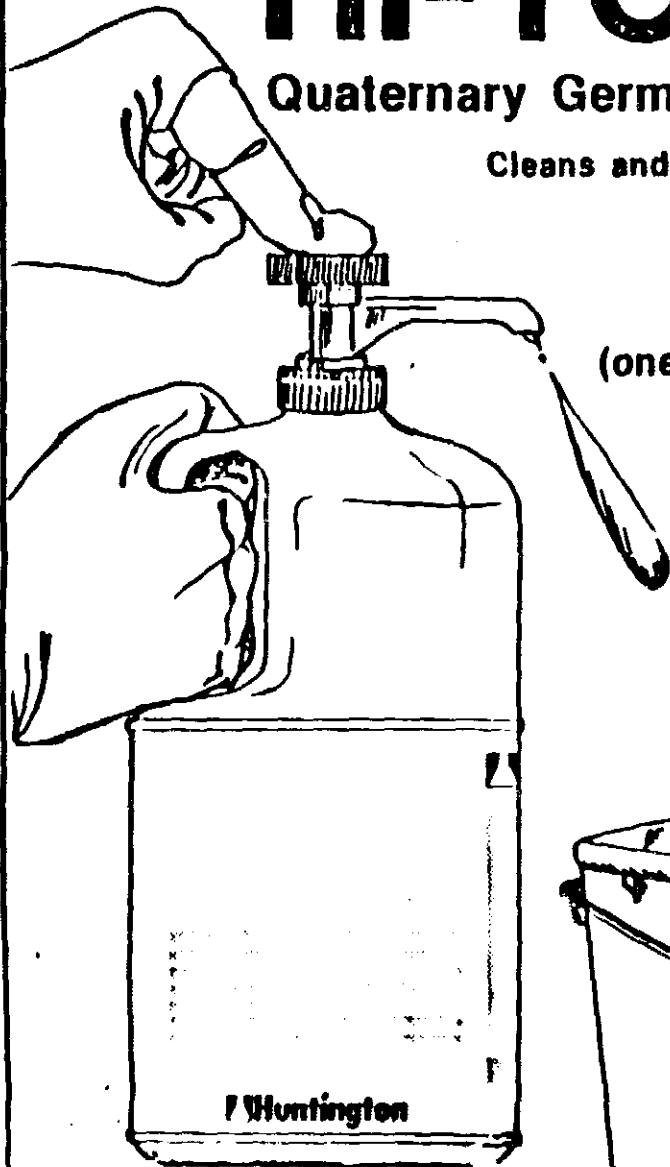
Quaternary Germicidal Detergent

Cleans and Disinfects

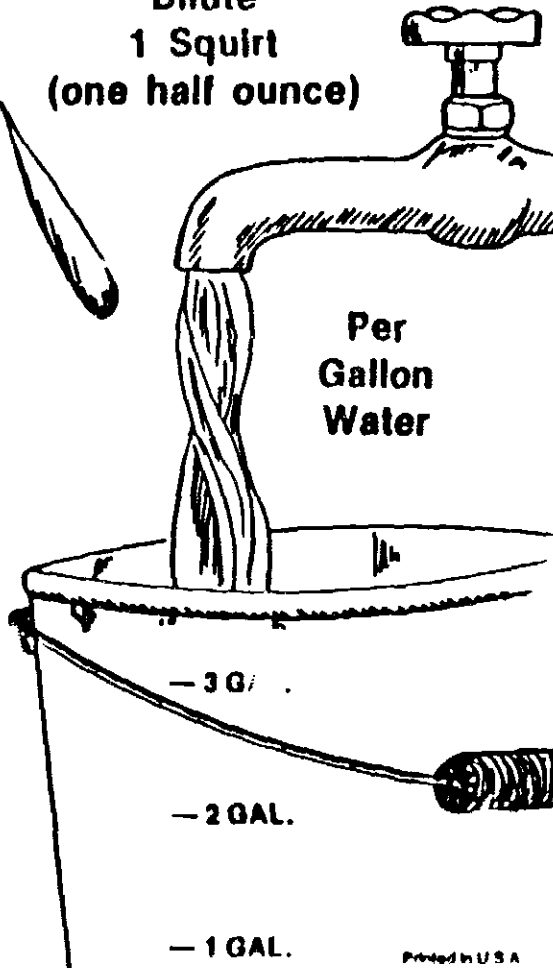
HI-TOR

Detergente Antiséptico

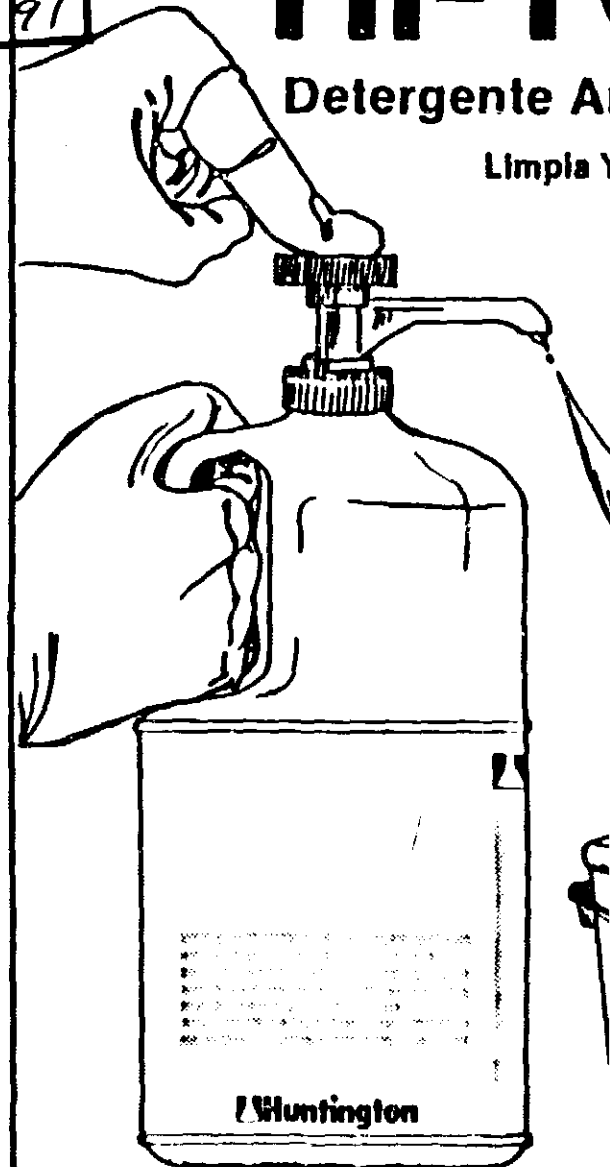
Limpia y Desinfecta



Dilute
1 Squirt
(one half ounce)



Per
Gallon
Water



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EPA Reg. No. 303-91

Made in U.S.A.

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