HI-TOR®

GERMICIDAL DETERGENT

ACCEPTED
OCT 0 6 1987
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide
EPA Reg. No. 303-91

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

Product Number 102714

PSEUDOMONACIDAL STAPHYLOCIDAL *VIRUCIDAL FUNGICIDAL

Hi-Tor Plus is a concentrated multi-purpose germicidal detergent proven effective by the AOAC Use-Dilution Method in 400 ppm hard water (Calculated as $CaCO_3$) in the presence of 5% organic bioload (Fetal Bovine Serum). Refer to the Hi-Tor Plus Research Bulletin for testing details.

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

Pseudomonas aeruginosa	Salmonella choleraesuis	Staphylococcus aureus +	*Adenovirus Type 2	*Rubella
Enterobacter aerogenes	Enterobacter cloacae	Staphylococcus aureus phage 80	*Herpes Simplex Type 1	*Avian Infectious Bronchitis
Escherichia coli +	Klebsiella pneumoniae +	Staphylococcus aureus phage 81	*Influenza Type A/Mich	*Avian Influenza A/Mich
Proteus mirabilis	Proteus vulgaris	Staphylococcus epidermidis +	*Vaccinia	*Bovine Parvovirus
Shigella flexneri	Shigella sonnei	Streptococcus pyogenes	*Adenovirus Type 4	*Infectious Bovine Rhinotracheitis
Enterococcus faecalis°	Serratia marcescens		*Herpes Simplex Type 2	

+Tested against regular and antibiotic resistant strains Trichophyton mentagrophytes Candida albicans °Tested against antibiotic resistant strain only

"Classified by Underwriters Laboratories Inc.®, as to electrical conductivity when used on conductive floors and spontaneous heating. Hi-Tor Plus 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 ½ ounce of Hi-Tor Plus 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 Plus 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 (C_{14} 50%, C_{12} 40%, C_{16} 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

(See shoulder or bottom of container for plant identification number)

HL-V

Huntington Laboratories, Inc., Huntington, IN 46750 • Lansdale, PA 19446
Dallas, TX 75227 • Oakland, CA 94621 • Bramalea, Ontario, Canada L6T 1E3

HI-TOR

GERMICIDAL DETERGENT

DILUTION 1:256 (½ OUNCE PER GALLON)

BACTERICIDAL
FUNGICIDAL
VIRUCIDAL*

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 $CaCO_3$) 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 $CaCO_3$) and 5% organic bioload.

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

CONTENTS

HUNTINGTON LABORATORIES, INC., Huntington, IN 46750 • 219/356-8100 • Lansdale, PA 19446 • Dallas, TX 75227 • Oakland, CA 94621 • Bramalea, Ont. L6T 1E3

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	Infecticus 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.

LABOF 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

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. The addition of the 5% organic bioload appears to accentuate the test variability.[5]

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.

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 9.0 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 ± 1 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 tests 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 C_{14} 50%, C_{12} 40%, and C_{16} 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 CFU/carrier is reported.

II. PRODUCT

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 10^2 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 10^1 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 $CaCO_3$) 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 $CaCO_3$) 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 $CaCO_3$)and 5% organic bioload (Fetal Bovine Serum).

RECOVERY MEDIUM: Letheen 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	56
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 33% more active quat in use-dilution than presumed the minimum required for practical disinfection by the A.O.A.C. standard.

ACCEPTED

OCT 06 1987

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

HI-TOR® IS BACTERICIDAL

PSEUDOMONACIDAL, SALMONELLACIDAL, STAPHYLOCIDAL IN THE PRESENCE OF 400 PPM HARD WATER (CALCULATED AS $CaCO_3$) 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 $CaCO_3$) and 5% organic bioload (Fetal Bovine Serum).

RECOVERY MEDIUM: Letheen Broth

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

RESULTS:

Sample	Staphylococcus aureus # tubes tested	Staphylococcus aureus # tubes with growth	Pseudomonas aeruginosa # tubes tested	Pseudomonas aeruginosa # tubes with growth	Salmonella choleraesuis # tubes tested	Salmonella choleraesuis # 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 $CaCO_3$) 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 $CaCO_3$) and 5% organic bioload (Fetal Bovine Serum).

RECOVERY MEDIUM: Letheen Broth

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

RESULTS:

	Staphylococcus aureus phage 80 # tubes tested	Staphylococcus aureus phage 80 # tubes showing growth	Staphylococcus aureus phage 81 # tubes tested	Staphylococcus aureus phage 81 # 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 $CaCO_3$) and 5% organic bioload (Fetal Bovine Serum).

HI-TOR® HAS BROAD SPECTRUM 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 $CaCO_3$) and 5% organic bioload (Fetal Bovine Serum).

RECOVERY MEDIUM: Letheen Broth

RESULTS:

Gram-Positive Bacteria	Plate Counts (CFU/Carrier)	# tubes tested	# tubes showing growth
Staphylococcus aureus	1.8×10^6	180	0
Staphylococcus aureus Phage 80	9.8×10^5	20	0
Staphylococcus aureus Phage 81	5.5×10^5	20	0
Streptococcus pyogenes	2.8×10^5	20	0
Staphylococcus epidermidis	1.4×10^6	20	0
Neutralization Control		+	

Gram-Negative Bacteria	Plate Counts (CFU/Carrier)	# tubes tested	# tubes showing growth
Pseudomonas aeruginosa	3.8×10^6	180	0
Salmonella choleraesuis	8.7×10^5	180	0
Enterobacter cloacae	2.0×10^6	20	0
Proteus vulgaris	4.5×10^5	20	0
Serratia marcescens	3.6×10^5	20	0
Proteus mirabilis	1.9×10^6	20	0
Klebsiella pneumoniae	6.7×10^5	20	0
Escherichia coli	1.1×10^6	20	0
Shigella sonnei	4.8×10^5	20	0
Shigella flexneri	1.9×10^6	20	0
Enterobacter aerogenes	4.6×10^6	20	0
Neutralization Control		+	

CONCLUSION: HI-TOR is effective at 1:256 dilution, (½ ounce/gallon) against a broad range of gram-positive and gram-negative hospital pathogens in the presence of 400 ppm hard water (calculated as $CaCO_3$) 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 $CaCO_3$) 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
Trichopyton mentagrophytes	2.3×10^6	20	0
Candida albicans	1.4×10^6	20	0
Neutralization		+	

CONCLUSION: HI-TOR is an effective fungicide at 1:256. (½ ounce/gallon) in the presence of 400 ppm hard water (calculated as $CaCO_3$) 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 $CaCO_3$) 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.

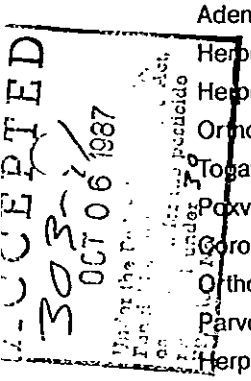
PRODUCT: HI-TOR diluted 1:256 with 400 ppm synthetic hard water (calculated as $CaCO_3$)

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 $CaCO_3$), is VIRUCIDAL to a wide range of VIRUSES contaminated with a 5% organic bioload (Fetal Bovine Serum).



HI-TOR KILLS ANTIBIOTIC RESISTANT BACTERIA

Antibiotic resistant bacterial strains pose problems in hospitals. Hi-Tor used properly can reduce the hazard of cross contamination by killing the antibiotic resistant bacteria on the hard surfaces in the hospital.

PRODUCT: HI-Tor diluted 1:256

TEST METHOD: AOAC Use-Dilution Confirmation Method, modified in the presence of 400 ppm Synthetic hard water.

RECOVERY MEDIA: Letheen Broth

Organism	Strain
Staphylococcus aureus	ATCC 33592
Staphylococcus aureus	*Clinical Isolate*
Staphylococcus epidermidis	*Clinical Isolate*
Enterococcus faecalis	*Clinical Isolate*
Escherichia coli	*Clinical Isolate*
Klebsiella pneumoniae	*Clinical Isolate*

RESULTS:

Gram-Positive Bacteria	Plate Counts (CFU/Carrier)	No. Carriers Tested	No. Carriers Showing Growth
Staphylococcus aureus 33592	2.6x10⁶	20	0
Staphylococcus aureus	2.8x10⁵	20	0
Staphylococcus epidermidis	2.49x10⁵	20	0
Enterococcus faecalis	1.73x10⁶	20	0
Gram-Negative Bacteria			
Escherichia coli	5.7x10⁵	20	0
Klebsiella pneumoniae	2.6x10⁶	20	0
Neutralization controls			+

CONCLUSION: HI-TOR kills antibiotic resistant bacteria at 1:256, (1/2 ounce per gallon) in the presence of 400 ppm hard water.

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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