TECHNICAL SUPPORT SECTION EFFICACY REVIEW - I

Disinfectants Branch

IN 01-30-86 OUT 03-17-86

Reviewed By Dorothy M. Portner 3/19/86 Date 03-17-86

EPA Reg. No. 46781-1

EPA Petition or EUP No. None

Date Division Received 01-08-86

Type Product Sterilizing/Disinfecting Solution

Data Accession No(s). 260965

Product Manager PM-31 (Lee)

Product Name Metricide Activated Dialdehyde Solution

Company Name Metrex Research Corporation

Submission Purpose Amended application to include 14-day reuse claims; efficacy data & proposed label provided

Type Formulation Liquid concentrate to used undiluted

Active Ingredient(s):	%
Glutaraldehyde	2.00

200.0 Introduction

200.1 Use

Proposed revised label is attached.

200.2 Background Information

The submission, received 1-8-86, included proposed labeling and efficacy data developed in accordance with an EPA approved reuse protocol. This is the 2nd simulated-reuse study conducted for this product.

201.0 Data Summary (260965)

The submitted data report, dated 1-13-86, included bactericidal, fungicidal, and tuberculocidal data for reuse solutions developed by K.H. Sibinovic, Shaldra Biotest Inc., W. Bethesda, MD; the virucidal data for the reuse solutions were developed by P,R. Roane, Integrity Bioservices Inc., Rockville, MD.

201.1 Test Protocol

The general test protocol and specific test procedures employed in this simulated-reuse study are attached. The submitted test schedule verifies that 3 complete washing/drying/disinfecting simulated-reuse operations were conducted daily with the following batch samples during the study:

Sample F (#0328517) reused from 09-15-85 thru 09-28-85.
Sample G (#0129851) reused from 09-15-85 thru 09-28-85.
Sample H (#240851) reused from 10-14-85 thru 10-27-85.
Sample I (#241851) reused from 10-24-85 thru 11-06-85.

201.2 Brief Description Of Test Conducted On The Reuse Solution

A. Bactericidal Testing

Method: AOAC Use Dilution Test with 5% soil
Exposure Time: 10 minutes at 20°C
Neutralizer Time: 4% $NaHSO_3$ for 10 minutes at 20°C
Subculture Medium: Nutrient Broth
Incubation Period: 48 Hours at 37°C

B. Fungicidal Testing

Method: AOAC Use Dilution Test with 5% soil
Exposure Time: 10 minutes at 20°C
Neutralizer Time: 4% $NaHSO_3$ for 10 minutes at 20°C
Subculture Medium: 2% Glucose Broth
Incubation Period: 10 days at 26°C

C. Tuberculocidal Testing

Method: AOAC Tuberculocidal Activity Test
Exposure Time: 10 minutes at 20°C
Neutralizer Time: 4% $NaHSO_3$ for 10 minutes at 20°C
Incubation Period: 90 days at 37°C

D. Sporicidal Testing

Method: AOAC Sporicidal Test
Exposure Time: 10 hours at 20°C
Neutralizer Time: 4% $NaHSO_3$ for 10 minutes at 20°C
Subculture Medium: Fluid Thioglycollate Medium USP XX
Incubation Period: 21 days at 37°C; Heat Shock 20 min. at 80°C; reincubated 3 days at 37°C

E. Virucidal Testing

The virucidal methodology employed is indicated below:

1. In each test, 0.5 ml aliquots of virus suspensions in 10% Fetal Bovine Serum (or in skim milk for the Herpes viruses) were dried on plastic petri dishes at room temperature under a laminar flow hood before exposure to the undiluted reuse solution for 2 minutes at 23°C.

2. Coxsackievirus, B5a (NIAID-V032), Poliovirus, Type 2 (Strain M-29), Echovirus, Type 8 (N-041) were propagated and assayed in baby Green Monkey Kidney cells. Adenovirus, Type 2 (NIH-STRAUS) was propagated and assayed in HEp-2 cells. Herpes simplex virus, Type 1 (F-Strain) and Herpes simplex virus, Type 2 were propagated in HEp-2 cells and assayed in MRC-5 cells.

3. After the exposure period, 0.01% sodium bisulfite was employed as a neutralizer for both the test and control samples.

F. The analytical procedure submitted is attached.

202.3 Test Results

A. Bactericidal Testing

Test Organism	Phenol Resist.	No. Positive/Total Tested #0328517	#0129851
S. choleraesuis	<1:90	0/180	0/180
S. aureus	<1:60	0/180	0/180
P. aeruginosa	<1:80	0/180	0/180

B. Fungicidal Testing

Test Organism	Phenol Resist.	No. Positive/Total Tested #0328517	#0129815
T. mentagrophytes	1:60	0/10	0/10

C. Tuberculocidal Testing

Test Medium	No. Positive/Total #0328517	#0129851	Phenol 1:50	Control 1:70
Mod. Proskauer-Beck	0/10	0/10	0/3	3/3
Middlebrook 7H9	0/10	0/10	0/3	3/3
TB Broth	0/10	0/10	0/3	3/3

D. Sporicidal Testing

Test Organism	Type Carrier	Acid Resist.	No. Positive/Total #0328517	#0129851
B. subtilis	Cylinder	20 min.	0/60	0/60
	Loop	20 min.	0/60	0/60
C. sporogenes	Cylinder	20 min.	0/60	0/60
	Loop	>20 min.	0/60	0/60

E. Virucidal Testing

Echovirus, Type 8 (N-041)

	#240851
Virus titer $TCID_{50}$	7.0
Virus + disinfectant $TCLD_{50}$	NVD
Cytotoxicity $TCTD_{50}$	NCT
Log reduction in titer	7.0

NVD = No virus detected.
NCT = No cytotoxicity.

Poliovirus, Type 2 (Strain-M-29)

	#0328517
Virus titer $TCID_{50}$	6.7
Virus + disinfectant $TCLD_{50}$	NVD
Cytotoxicity $TCTD_{50}$	NCT
Log reduction in titer	6.7

NVD = No virus detected.
NCT = No cytotoxicity.

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Adenovirus, Type 2 (NIH-STRAUS)

	#240851
Virus titer $TCID_{50}$	6.5
Virus + disinfectant $TCLD_{50}$	NVD
Cytotoxicity $TCTD_{50}$	NCT
Log reduction in titer	6.5

NVD = No virus detected.
NCT = No cytotoxicity.

Coxsackievirus, B5a (NIAID-V032)

	#240851
Virus titer $TCID_{50}$	7.5
Virus + disinfectant $TCLD_{50}$	3.5
Cytotoxicity $TCTD_{50}$	NCT
Log reduction in titer	4.0

NCT = No cytotoxicity.

Herpes simplex virus, Type 1 (F Strain)

	#241851
Virus titer $TCID_{50}$	7.0
Virus + disinfectant $TCLD_{50}$	$\leq$3.5
Cytotoxicity $TCTD_{50}$	3.5
Log reduction in titer	$\geq$3.5

Herpes simplex virus, Type 2 (G Strain)

	#241851
Virus titer $TCID_{50}$	7.0
Virus + disinfectant $TCLD_{50}$	$\leq$3.5
Cytotoxicity $TCTD_{50}$	3.5
Log reduction in titer	$\geq$3.5

F. Determination of pH and Glutaraldehyde Concentration

Test	Sample #0328517		Sample #129851	
Day	pH	Glutaraldehyde	pH	Glutaraldehyde
0	8.0	2.07%	8.1	2.07%
7	7.6	1.93%	7.7	1.93%
14	7.2	1.79%	7.3	1.50%

201.4 Conclusions

A. The submitted data demonstrate a satisfactory performance to support the following use patterns/ efficacy claims for activated solutions reused for 14 days:

1. Sterilization in 10 hours at 20°C.

2. Disinfection in 10 minutes at 20°C.

a. Bactericidal activity

b. Fungicidal activity

c. Virucidal activity against Herpes simplex viruses, Type 1 and 2, Adenovirus, Type 2, Poliovirus, Type 2, and Echovirus, Type 8

B. The submitted virucidal data showed that the 14-day reused solution did not completely inactivate Coxsackievirus B5a.

C. The submitted tuberculocidal data demonstrate a satisfactory product performance in 10 minutes at 20°C. However, since the Agency has evidence that reused solutions of glutaraldehyde-based products may provide inconsistent tuberculocidal results under the use conditions of 10 minutes and 20°C, validation testing is recommended before acceptance of these data.