



CAVICIDE®

Technical Bulletin

CaviCide is a general purpose disinfectant intended for use in cleaning, decontaminating and disinfecting equipment surfaces and non-critical instruments in hospitals, laboratories, and other critical care areas where environmental control of cross contamination is important.

CaviCide has biocidal effectiveness against the following microorganisms with a contact time of 3 minutes:

Mycobacterium bovis BCG
Staphylococcus aureus
Pseudomonas aeruginosa
Salmonella enterica
Klebsiella pneumoniae
Bordetella pertussis
Multi-Drug Resistant (MDR) *Acinetobacter baumannii*
Extended Spectrum β -lactamase *Escherichia coli* (ESBL)
Methicillin Resistant *Staphylococcus aureus* (MRSA)
Vancomycin Resistant *Enterococcus faecalis* (VRE)
Staphylococcus aureus with Reduced Susceptibility to Vancomycin
Trichophyton mentagrophytes
Candida albicans
Herpes Simplex Type 1
Herpes Simplex Type 2
Human Immunodeficiency Virus (HIV-1)
Hepatitis C Virus (HCV)
Coronavirus
Influenza A2 Virus

Tuberculocidal Efficacy Studies:

Mycobacterium bovis BCG

“AOAC Tuberculocidal Activity of Disinfectants”

MicroBiotest, Inc. May 18, 2004. Lab ID # 198-294.

Conclusion: When tested as described, CaviCide passed the AOAC Tuberculocidal Activity of Disinfectants Test when *M. bovis* was exposed to the test material for 3 minutes at 20±2C.

“AOAC Tuberculocidal Activity of Disinfectants Confirmatory In Vitro Test”

MicroBiotest, Inc. February 29, 2000. Lab ID # 386-113.

Conclusion: CaviCide passes the AOAC Tuberculocidal Test when *M. bovis* is exposed to the test material at 20±2C.

“AOAC Tuberculocidal Activity of Disinfectants Confirmatory In Vitro Test”

MicroBiotest, Inc. August 15, 2000. Lab ID # 198-214.

Conclusion: CaviCide exposed to *Mycobacterium bovis* at 20±2C passed the AOAC Tuberculocidal Test.

“AOAC Confirmative Tuberculocidal Activity of CaviCide”

MicroChem Laboratory. July 19, 1994. Lab ID# 940412-2.

Conclusion: CaviCide killed 100% of the *Mycobacterium bovis* BCG labeled cylinders at 20°C. CaviCide can pass the AOAC Confirmative Tuberculocidal Test at 20°C.

Bactericidal Efficacy Studies:

Staphylococcus aureus

Pseudomonas aeruginosa

Salmonella enterica

Klebsiella pneumoniae

Bordetella pertussis

Multi-Drug Resistant (MDR) *Acinetobacter baumannii*

Extended Spectrum β–lactamase *Escherichia coli* (ESBL)

Methicillin Resistant *Staphylococcus aureus* (MRSA)

Vancomycin Resistant *Enterococcus faecalis* (VRE)

Staphylococcus aureus with Reduced Susceptibility to Vancomycin

“CaviCide versus *Staphylococcus aureus* in the AOAC Germicidal Spray Products Test”

MicroChem Laboratory. January 9, 1995. Lab ID# 914201-1; 941208-1; 941209-1; 941229-1; 950103-1; 950105-1.

Conclusion: Diluted CaviCide (worst case solution with minimum manufacturing concentrations of Isopropanol and Hyamine 1622) passed the AOAC Germicidal Spray Products Test 961.02 when tested against *S. aureus* at 20±1°C.

“AOAC Use-Dilution Test: Evaluation of the Efficacy of CaviCide against *Staphylococcus aureus*” (confirmatory)

ViroMed Laboratories, Inc. May 27, 1993. Amended Report November 2, 1993. Lab ID# 391-SA

Conclusion: Two lots of CaviCide, used undiluted, demonstrated no growth on any of the carriers in the primary subculture when tested against *S. aureus*. Under the conditions of this study, CaviCide was germicidal against *S. aureus*.

“CaviCide versus *Pseudomonas aeruginosa* in the AOAC Germicidal Spray Products Test”

MicroChem Laboratory. January 3, 1995. Lab ID# 914201-1; 941208-1; 941209-1; 941216-1; 941221-1; 941227-1.

Conclusion: Diluted CaviCide (worst case solution with minimum manufacturing concentrations of Isopropanol and Hyamine 1622) passed the AOAC Germicidal Spray Products Test when tested against *P. aeruginosa* at 20±2°C.

“AOAC Use-Dilution Test: Evaluation of the Efficacy of CaviCide against *Pseudomonas aeruginosa* (confirmatory)

ViroMed Laboratories, Inc. November 9, 1993. Lab ID# 533-PA

Conclusion: Two lots of CaviCide used undiluted, demonstrated no growth on any of the carriers in the primary subculture when tested against *P. aeruginosa*. Under the conditions of this study, CaviCide was germicidal against *P. aeruginosa*.

“CaviCide versus *Salmonella enterica (choleraesuis)* in the AOAC Germicidal Spray Products Test”

MicroChem Laboratory. January 18, 1995. Lab ID# 914201-1; 941208-1; 941209-1; 950111-1; 950116-1.

Conclusion: Diluted CaviCide (worst case solution with minimum manufacturing concentrations of Isopropanol and Hyamine 1622) passed the AOAC Germicidal Spray Products Test when tested against *S. enterica* at 20±1°C.

“AOAC Use-Dilution Test: Evaluation of the Efficacy of CaviCide against *Salmonella enterica (choleraesuis)* (confirmatory)

ViroMed Laboratories, Inc. November 9, 1993. Lab ID# 533-PA

Conclusion: Two lots of CaviCide used undiluted, demonstrated no growth on any of the carriers in the primary subculture when tested against *S. enterica*. Under the conditions of this study, CaviCide was germicidal against *S. enterica*.

The following study was performed on CaviWipes. CaviWipes are non-woven disposable towelettes pre-saturated with CaviCide. This study has been bridged to support the CaviCide product claim.

“Testing Pre-Saturated or Impregnated Towelettes for Hard Surface Disinfection- *Klebsiella pneumoniae*”

MicroBiotest, Inc. December 14, 2010. Lab ID # 198-612.

Conclusion: When tested as described, CaviWipes passed when *Klebsiella pneumoniae*, containing at least 5% organic load was exposed to the test agent for three minutes at 21°C.

The following study was performed on CaviWipes. CaviWipes are non-woven disposable towelettes pre-saturated with CaviCide. This study has been bridged to support the CaviCide product claim.

“Testing Pre-Saturated or Impregnated Towelettes for Hard Surface Disinfection- *Bordetella pertussis*”

MicroBiotest, Inc. December 30, 2010. Lab ID # 198-613.

Conclusion: When tested as described, CaviWipes passed when *Bordetella pertussis*, containing at least 5% organic load was exposed to the test agent for three minutes at 21°C.

The following study was performed on CaviWipes. CaviWipes are non-woven disposable towelettes pre-saturated with CaviCide. This study has been bridged to support the CaviCide product claim.

“Testing Pre-Saturated or Impregnated Towelettes for Hard Surface Disinfection- Multi Drug Resistant *Acinetobacter baumannii*”

MicroBiotest, Inc. November 30, 2010. Lab ID # 198-611.

Conclusion: When tested as described, CaviWipes passed when Multi-Drug Resistant *Acinetobacter baumannii*, containing at least 5% organic load was exposed to the test agent for three minutes at 21°C.

The following study was performed on CaviWipes. CaviWipes are non-woven disposable towelettes pre-saturated with CaviCide. This study has been bridged to support the CaviCide product claim.

“Testing Pre-Saturated or Impregnated Towelettes for Hard Surface Disinfection- Extended Spectrum β -lactamase *Escherichia coli* (ESBL)”

MicroBiotest, Inc. November 30, 2010. Lab ID # 198-614.

Conclusion: When tested as described, CaviWipes passed when Extended Spectrum β -lactamase *Escherichia coli* (ESBL), containing at least 5% organic load was exposed to the test agent for three minutes at 21°C.

“CaviCide versus Methicillin Resistant *Staphylococcus aureus* (MRSA) in the AOAC Germicidal Spray Products Test”

MicroChem Laboratory. April 19, 1995. Lab ID# 950406-1.

Conclusion: Two lots of CaviCide diluted to the minimum manufacturing concentrations of Isopropanol and CaviCide passed the AOAC Germicidal Spray Products Test against MRSA at 20±1°C.

“CaviCide versus Vancomycin Resistant *Enterococcus faecalis* (VRE) in the AOAC Germicidal Spray Products Test”

MicroChem Laboratory. April 19, 1995. Lab ID# 950406-1.

Conclusion: Two lots of CaviCide diluted to the minimum manufacturing concentrations of Isopropanol and CaviCide passed the AOAC Germicidal Spray Products Test against VRE at 20±1°C.

Fungicidal/Yeast Efficacy Studies

Trichophyton mentagrophytes

Candida albicans

“Fungicidal Activity of CaviCide in a Stainless Steel Cylinder Use-Dilution Test and in Suspension”

MicroChem Laboratory. January 24, 1994. Lab ID# 931230-1; 940104-1; 940106-1; 940110-2; 940112-4; 940114-2.

Conclusion: CaviCide killed *Trichophyton mentagrophytes* and *Candida albicans* in suspension at 20±1°C. CaviCide also killed these fungi on stainless steel surfaces at 20±1°C.

The following study was performed on CaviWipes. CaviWipes are non-woven disposable towelettes pre-saturated with CaviCide. This study has been bridged to support the CaviCide product claim.

“Testing Pre-Saturated or Impregnated Towelettes for Hard Surface Disinfection- *Candida albicans*”

MicroBiotest, Inc. December 23, 2010. Lab ID # 198-617.

Conclusion: When tested as described, CaviWipes passed when *Candida albicans*, containing at least 5% organic load was exposed to the test agent for three minutes at 21°C.

Virucidal Studies

Herpes Simplex Virus Type 1

Herpes Simplex Virus Type 2

Human Immunodeficiency Virus (HIV-1)

Hepatitis C Virus (HCV)

Coronavirus

Influenza A2 Virus

“CaviCide v. *Herpes Simplex Virus Type 1*” (Spray)

Gibraltar Biological Laboratories, Inc. July 31, 1984. Lab ID# 278-161-1053.

Conclusion: CaviCide inactivated Herpes Simplex Virus Type 1 at 30 seconds.

“CaviCide v. *Herpes Simplex Virus Type 1*” (Liquid)

Gibraltar Biological Laboratories, Inc. July 31, 1984. Lab ID# 279-161-1056.

Conclusion: CaviCide inactivated Herpes Simplex Virus Type 1 at 30 seconds.

“CaviCide v. *Herpes Simplex Virus Type 2*” (Spray)

Gibraltar Biological Laboratories, Inc. July 31, 1984. Lab ID# 275-161-1040.

Conclusion: CaviCide inactivated Herpes Simplex Virus Type 2 at 30 seconds.

“CaviCide v. *Herpes Simplex Virus Type 2*” (Liquid)

Gibraltar Biological Laboratories, Inc. July 31, 1984. Lab ID# 276-161-1044.

Conclusion: CaviCide inactivated Herpes Simplex Virus Type 2 at 30 seconds.

“Virucidal Efficacy of CaviCide Against the *Human Immunodeficiency Virus (HIV-1)*”

Southern Research Institute. July 14, 1992. Lab ID# 0051.

Conclusion: CaviCide demonstrated virucidal activity against HIV-1 in a CPE assay with MT-2 cells during a 2 minute exposure period.

“Virucidal Effectiveness Test Using Bovine Viral Diarrhea Virus (BVDV)-Surrogate for Human Hepatitis C Virus”

MicroBiotest, Inc. April 14, 2003. Laboratory ID# 198-282.

Conclusion: When tested as described, CaviCide passed the Virucidal Effectiveness Test when BVDV, containing at least 5% organic load, was exposed to the test material at 20±2°C.

“Confirmatory Virucidal Effectiveness Test Using Bovine Viral Diarrhea Virus (BVDV)-Surrogate for Human Hepatitis C Virus”

MicroBiotest, Inc. April 17, 2003. Laboratory ID# 198-283.

When tested as described, CaviCide passed the Confirmatory Virucidal Effectiveness Test when BVDV, containing at least 5% organic load, was exposed to the test agent at 20±2°C.

“Virucidal Effectiveness Test using Bovine Viral Diarrhea Virus (BVDV) – Cell Associated”

MicroBiotest, Inc. May 18, 2001. Laboratory ID# 198-248.

When tested as described, CaviCide passed the Virucidal Effectiveness Test when BVDV (surrogate for human Hepatitis C Virus)-cell associated, containing 50% whole blood as soil load, was exposed to the test material at 20±2°C.

“Virucidal Effectiveness Test *Coronavirus*”

MicroBiotest, Inc. October 15, 2003. Lab ID # 198-287.

Conclusion: When tested as described, CaviCide passed the Virucidal Effectiveness Test when Human Coronavirus, containing at least 5% organic load, was exposed to the test agent for 1 minute at 20±2°C.

“Virucidal Effectiveness Test Human Influenza Virus”

MicroBiotest, Inc. July 30, 2004. Lab ID # 198-308.

Conclusion: When tested as described, CaviCide passed the Virucidal Effectiveness Test when Influenza A2 virus containing at least 5% organic load was exposed to the test agent for 30 seconds at 20±2°C.

Toxicity Studies

Oral Toxicity

Inhalation Toxicity

Dermal Toxicity/Irritation/Sensitization

Ocular Irritation

“Acute Oral Toxicity Study of CaviCide in Sprague-Dawley Rats”

American Standards Biosciences Corporation. May 23, 1986. Lab ID# 86-367.

CaviCide was tested for potential acute oral toxicity in accordance with the procedure outlined in the Pesticide Assessment Guidelines. No signs of toxicity were exhibited at any time during the 14-day observation period of this study. Based on the results obtained in this study, the acute oral toxicity LD₅₀ of CaviCide is greater than 5gm/kg of body weight.

“Acute Inhalation Toxicity Limit Test: CaviCide”

Product Safety Labs. May 20, 1996. Lab ID# 4244.

“An Acute Inhalation Toxicity Test was conducted with rats to determine the potential for CaviCide to produce toxicity via the inhalation route at an exposure level of 2.0 mg/L. Based on the results of this study, the single exposure Acute Inhalation LC₅₀ of the test substance is greater than 2.08 mg/L.

“Acute Dermal Toxicity Study of CaviCide on New Zealand Albino Rabbits”

American Standards Biosciences Corporation. June 6, 1986. Lab ID# 86-368.

CaviCide was tested to evaluate the potential dermal toxicity on New Zealand Rabbits. The animals did not exhibit any signs of toxicity during the 14-day observation period. Skin reactions did not reveal any erythema, eschar or edema. Based on the results obtained in this study, the LD₅₀ is greater than 2.0 gm/kg of body weight.

“Primary Dermal Irritation in Rabbits: CaviCide”

American Standards Biosciences Corporation. September 18, 1986. Lab ID# 86-591.

CaviCide was tested for potential dermal irritation in accordance with the procedure outlined in the Pesticide Assessment Guidelines. CaviCide exhibited no erythema, no edema and no eschar at 1, 24, 48 and 72 hour intervals during the observation period. Based on the results obtained in this study, CaviCide is not considered an irritant.

“Dermal Sensitization Test: CaviCide”

Product Safety Labs. May 20, 1996. Lab ID# 4243.

“A dermal sensitization test was conducted with guinea pigs to determine the potential for CaviCide to produce sensitization after repeated topical applications. Based on the results of this study, CaviCide is not considered to be a contact sensitizer.

“Primary Eye Mucosa Irritation in Rabbits: CaviCide”

American Standards Biosciences Corporation. September 25, 1986. Lab ID# 86-590.

New Zealand Albino Rabbits weighing between 2.0-3.0 kg were employed to evaluate the potential irritant effects of CaviCide on the eye mucosa. Based on the criteria outlined in “Grades for Ocular Lesions: Pesticide Assessment Guidelines”, CaviCide exhibited positive effects that were reversible.

Stability Studies

“Physical and Chemical Characteristics of CaviCide: Storage Stability and Corrosion Characteristics - 1 Year at Room Temperature”

Case Consulting Laboratories. February 11, 1997. Lab ID# 63-17 and 63-20.

Physical Assessment after 1 Year at Room Temperature: No physical changes were noted for the test substance. Corrosion Characteristics after 1 Year at Room Temperature: No changes noted in the high density polyethylene packaging material.

“CaviCide Product Chemistry and Storage Stability Data”

Metrex Research Corporation. November 3, 2004. Lab ID# M2002.

Conclusion: Three lots of CaviCide were stored at 25±2°C /60% RH. All parameters were found to be within specification during the course of the 24 month study. The data justifies expiration dating of 2 years.