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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF
PREVENTION,
PESTICIDES
AND TOXIC
SUBSTANCES

February 12, 2009

MEMORANDUM

Subject: Efficacy Review for EPA Reg. No. 68660-RN, Interlox 35% Hydrogen Peroxide; DP Barcode: 353062

From: Tajah L. Blackburn, Ph.D., Microbiologist
Efficacy Evaluation Team
Product Science Branch
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Thru: Michele Wingfield, Chief
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To: Marshall Swindell PM 33/ Demson Fuller
Regulatory Management Branch I
Antimicrobials Division (7510P)

Applicant: Solvay Chemicals, Inc.
3333 Richmond Avenue
Houston, TX 77098

Formulations from Label

<u>Active Ingredient(s)</u>	<u>% by wt.</u>
Hydrogen Peroxide.....	35.0%
<u>Other Ingredients</u>	<u>65.0%</u>
Total	100.0%

I BACKGROUND

The product, Interlox 35% Hydrogen Peroxide, is a new product. The current data package was submitted to support sterilant registration for aseptic packaging and associated manufacturing/filling equipment. Per the registrant "hydrogen peroxide has previously been approved for the use (see product labels for EnviroSan EPA Reg. No. 1677-85, and VigorOx SP-15 Antimicrobial Agent EPA Reg. No. 65402-3). However, Interlox 35% Hydrogen Peroxide is proposing a higher use-rate for hydrogen peroxide than previously approved."

The current data package contains a letter from the registrant's representative (dated April 15, 2008), EPA Form 8570-4 (CSF), EPA Form 8570-34 (Certification with Respect to Citation of Data), EPA Form 8570-1 (Application for Pesticide), EPA Form 8570-35 (Data Matrix), one efficacy study (MRID No. 474190-04), Statement of No Data Confidentiality Claims, and the proposed label.

Note: According to the registrant's letter, "the use of hydrogen peroxide as a sterilant for aseptic packaging is subject to an FDA regulation under 21 CFR § 178.1005. In addition, the Antimicrobial Regulation Technical Corrections Act of 1998 (ARTCA) gives jurisdiction to FDA for regulating, under Section 409 of the Federal Food, Drug, and Cosmetic Act (FFCDA), residuals of an antimicrobial applied to food-packaging materials."

II USE DIRECTIONS

The product is intended for use in aseptic packaging in commercial sterilization for food contact surfaces and food processing equipment. Directions on the proposed label provided the following instructions for the preparation and use of the product:

Apply Interlox Hydrogen Peroxide on the interior and/or exterior of food containers and closure systems (caps, seals, etc) or appropriate food processing equipment surfaces. Apply 350,000 ppm of hydrogen peroxide at a temperature of 75°C. The hydrogen peroxide solution must remain in contact with the surface for 20 seconds; contact times and temperatures may vary depending on the specific type of aseptic food processing line.

III AGENCY STANDARDS FOR PROPOSED CLAIMS

Sterilizers

The AOAC Sporidical Test is required for substantiating sterilizing claims. The following information applies to all products represented as sporicidal or sterilizing agents. Sixty carriers, representing each of 2 types of surfaces (porcelain penicylinders and silk suture loops), must be tested against spores of both *Bacillus subtilis* (ATCC 19659) and *Clostridium sporogenes* (ATCC 3584) on 3 product samples representing 3 different product lots, one of which is at least 60 days old (240 carriers per sample; a total of 720 carriers). Any sterilizing agent (liquid, vapor, or gas) that is recommended for use in a specific device must be tested by the AOAC Sporidical Test in that specific

device and according to the directions for use. Killing on all of the 720 carriers is required; no failures are permitted. Data to support sterilizing claims must be confirmed by tests conducted by a second, independent laboratory of the applicant's choice (other than the laboratory that developed the original data). The following minimal confirmatory data must be developed on one sample of the product: Thirty carriers with each of 2 types of surfaces (silk suture loops and porcelain penicylinders) against spores of both *Bacillus subtilis* and *Clostridium sporogenes* (a total of 120 carriers) by the AOAC Sporicidal Test.

IV SYNOPSIS OF SUBMITTED EFFICACY STUDY

1. MRID No. 474190-04, "Modification of the AOAC Sporicidal Method to Determine Efficacy of Products Used in Aseptic Filling Applications" against *Bacillus subtilis* (ATCC 19659) and *Clostridium sporogenes* (ATCC 3584) utilizing Interlox AG Bath 35-S by Amy Jeske, B.S. Study completion date—March 6, 2008. Project Number A05517.

This study was conducted against *Bacillus subtilis* (ATCC 19659) and *Clostridium sporogenes* (ATCC 3584). Three lots (Lot Nos. 70424D10HP, 70906D10HP, and 70705D10HP) are product, Interlox AG Bath 35-S, were tested using modifications of the AOAC Sporicidal Activity method. One product lot (Lot No. 70424D10HP) was at least 60 days old at the time of testing. Stainless steel carriers were immersed for 15 minutes in either 72±4 hour old broth culture of *Clostridium sporogenes* or *Bacillus subtilis* spore suspension at a ration of 1 carrier per 1.0 ml culture. Following inoculation, the carriers were placed into a Petri dish matted with filter paper. The contaminated carriers were transferred to a vacuum dessicator containing CaCl₂ and the vacuum was drawn to ≥69 Hg for the entire drying and storage period. The contaminated carriers were dried in the dessicator for 24 hours. The contaminated carriers used in test and controls, were dried for ~ 3-4 days prior to use. The test substance was received ready-to-use. Ten (10.0) ml of the test substance was aliquoted into individual sterile 25 x 150 mm tubes. The tubes were placed into a waterbath at 75±2°C for temperature equilibration. Each contaminated carrier was placed into separate tubes containing 10.0 ml of test substance at its use-dilution for a 20±1 second contact period at 75±2°C. Following the completion of the contact period, each medicated carrier was transferred by hook needle to primary subculture tubes containing 10 ml Fluid Thioglycollate Medium with 0.05% catalase. Carriers were transferred from primary subculture tubes into individual secondary subculture tubes containing Fluid Thioglycollate Medium. Subculture tubes were incubated for 21 days at 35-37°C. Following incubation, the subculture tubes were visually examined for growth. Tubes demonstrating growth were subcultured onto appropriate agar medium for confirmation of the test organism and incubated under appropriate conditions. A gram stain and a macroscopic examination of colony morphology were performed from the confirmation subculture plates. Tubes demonstrating no growth of the test organisms were heat shocked for 20 minutes at 80±2°C and reincubated for 72±4 hours at 35-37°C. Following the 72±4 hour incubation, the subculture tubes from testing were visually examined for growth upon completion of the incubation period. Controls included those for purity, sterility, viability, carrier counts, neutralization confirmation, and HCl resistance.

Protocol Amendment: Per Sponsor's request, this protocol is being amended to retest Interlox AG Bath 35-S Lot No. 70705D10HP against stainless steel penicylinders inoculated with *Clostridium sporogenes* for potential false positives.

Note: The registrant included in the data package that Interlox AG Bath 35-S is another designation for Interlox 35% Hydrogen Peroxide. The composition is identical.

V RESULTS

Test Organism	Date Performed	CFU/carrier
<i>Bacillus subtilis</i>	11/20/07	1.32 x 10 ⁶ CFU/carrier
<i>Clostridium sporogenes</i>	11/20/07	2.43 x 10 ⁶ CFU/carrier
	1/18/08	3.17 x 10 ⁵ CFU/carrier

Lot No.	Test Date	Test Organism	Total Carriers Tested	Number of Carriers Showing Growth of the Test Organisms			
				1°	2°	1°HS	2°HS
#70424D10HP	11/20/07	<i>B. subtilis</i>	60	0	0	0	0
		<i>C. sporogenes</i>	60	0	0	0	0
#70705D10HP	11/20/07	<i>B. subtilis</i>	60	0	0	0	0
		<i>C. sporogenes</i>	60	0	1	0	1
	1/18/08	<i>C. sporogenes</i>	60	0	0	0	0
#70906D10HP	11/20/07	<i>B. subtilis</i>	60	0	0	0	0
		<i>C. sporogenes</i>	60	0	0	0	0

VI CONCLUSIONS

1. The submitted efficacy data support the use of the product, Interlox 35% Hydrogen Peroxide, as a sterilant to achieve commercial sterility in validated facilities when used at 350,000 ppm of hydrogen peroxide at a temperature of 75°C for a contact time of 20 seconds when tested against *Bacillus subtilis* (ATCC 19656) and *Clostridium sporogenes* (ATCC 3584).

VII RECOMMENDATIONS

1. The proposed label claims are acceptable regarding the use of the product, Interlox 35% Hydrogen Peroxide, as a sterilant for aseptic packaging in commercial sterility in validated facilities at a 350,000 ppm hydrogen peroxide at a temperature of 75°C for a contact time of 20 seconds. Data provided by the applicant support these claims.