EEE BRANCH REVIEW

DATE: IN ____ OUT ____ IN ____ OUT ____ IN 12/7 OUT 2/15/78

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 10466-EI

PETITION OR EXP. PERMIT NO. ____

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DATA ACCESSION NO(S). 232252

PRODUCT MGR. NO. 33

PRODUCT NAME(S) Steri-Chem DM-50N

COMPANY NAME Thompson Research Associates, Ltd.

SUBMISSION PURPOSE Preservative for fabric, adhesive, paint, and vinyl

CHEMICAL & FORMULATION Tri-n-butyltin maleate; 25% liquid

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Efficacy Review

200.0 Introduction

200.1 Uses

For the manufacture of mildew resistant fabric, for in-~~use~~ CAN preservation of latex paint and water-based adhesives, for the protection of applied adhesive films against fungal attack, for the manufacture of mildew resistant interior acrylic latex paint and vinyl plastics.

201.0 Data Summary

201.1 Abstract of Test Reports

A. Minimum Inhibitory Concentration.

This test was to determine the minimum inhibitory concentration of tributyltin maleate to various fungi. The most resistant fungus tested was A. niger with an MIC of 37 ppm. Chaetomium globosum and Candida albicans were most susceptible with MICs of less than 1 ppm.

B. Mildew Resistance of Treated Fabric.

1. This was a 3 part test. In the first part, cotton fabric was subjected to Aspergillus niger for 2 weeks. Nutrients were added to the cloth. No growth occurred on cloth treated with 0.4% o.w.f. in the two week period. The method used was Canadian Government Specification Board Standard 4-GP-2, method 28.2. Details of the method were lacking.

The second part of this test was to determine the effect of the product on cellulolytic fungi. No nutrients were added in this test. Cotton fabric treated with 0.4% o.w.f. was inoculated for 2 weeks. No growth occurred on treated fabric in the two week period. The method used was CGSB Standard 4-GP-2, method 28.4.

The third part of this test was in a soil burial test (CGSB Standard 4-GP-2, method 28.3) conducted for a two week period. Tensile strength loss was determined at the end of this period. The untreated samples had 100% loss. Unleached fabric had 5% loss, leached fabric lost 8%. Cotton fabric treated with 0.4% o.w.f. of product was used.

2. Cotton fabric was treated with 0.4% o.w.f. of Stain-era-Septic DM-50N was treated using EPA Fabric Mildew Fungistatic test method. There was no fungal growth on any samples for the duration of the test (4 weeks).

3. Tests conducted on fire hose were the CGSB methods for soil burial and cellulytic fungi. Treated fire hose retained 94.3% of original strength; untreated had 23.2%. No growth of Chaetomium globosum was observed in the cellulytic test. It was not indicated what treatment rate was used for treating the hose.

4. Treatment of laminated fabric. The treatment solution was padded on to provide levels of 0.09%, 0.2% and 0.3% based on fabric weight. Treated samples were laundered a total of 50 times. Discs of treated fabric were taken after 5, 10, 20, 30, 40 and 50 launderings and placed on agar plates with A. niger or P. variable. Ratings were made based on a zone of inhibition or contact inhibition on a scale of 1 to 5. A rating of 3 was satisfactory, 4 was good, 5 was excellent. Aspergillus was controlled at all concentrations. Penicillium was controlled only at the 0.3% level.

C. Adhesives.

Two adhesives, one dextrin-based and one protein-based were applied to filter paper discs and allowed to dry. The discs were then placed on mineral agar in petri plates and inoculated with A. niger. The discs were transferred to new agar at 28 day intervals and reinoculated at each transfer. Twelve transfers were made for a total of 336 days. The rates of product used were 0.04, 0.08, and 0.16%. There was no growth on either adhesive treated with 0.08 or 0.16%.

D. Vinyl polymer solutions

A single layer of vinyl polymer solution was applied to filter paper discs which were placed in agar plates then inoculated with A. niger or Streptoverticillium reticulum (pink stain). There was fungal overgrowth of the vinyl at 0.1% concentration but none at 0.2%. There was no growth of S. reticulum at either concentration.

E. Latex Paint

Latex paint was applied to filter paper and placed on agar then inoculated with A. niger or Pullularia pullulans. Ratings were made from 0 (no growth) to 5+ (complete overgrowth). There was slight growth of A. niger at 2 weeks, but no growth of Pullularia.

202.0 Conclusions and Recommendations

202.1 Claims Supported by the Data Submitted

The data are sufficient to support a claim to render fabric resistant to growth of mold and mildew with a treatment rate of 0.4%. Data also support the claim to protect applied aqueous dextrin or protein based adhesive films against fungal attack with a concentration of 0.08%.

202.2 Claims Not Supported by the Data Submitted

Dosage rates lower than 0.4% were not evaluated except in the case of laminated fabric which gave marginal control with 0.3%. The claim for use as a preservative for fabric is not justified. This implies prevention of rot as well as mold and mildew. The soil burial tests used were not of sufficient duration. The soil burial test should be conducted for a minimum of 4 weeks. Testing should be conducted according to Federal Test Method Standard, Oct. 5, 1972. Mildew Resistance of Textile Materials; Soil Burial Method. Method 5762.1 in Textile test Methods No. 191, General Services Administration, Washington, D.C. 20407 for those fabrics intended for soil contact use. For rot and decay claims for textiles not intended for soil contact, test according to Federal Test Method Standard, Dec. 31, 1968. Mildew Resistance of Textile Materials; mixed culture method. Method 5760 in Textile Test Methods No. 191, GSA, Washington, D.C. 20407.

Labeling for fabrics must be clarified by indicating types of fabrics to be treated and type of organisms (rot and decay or mold and mildew) which are to be controlled.

No tests were conducted demonstrating in-can preservation of adhesives or latex paints against fungi. No standard methods are available for this use. A protocol should be developed and submitted for review before testing the product for these claims.

In the labeling, list those systems referred to as "related aqueous emulsion systems" and submit data to support this use. Limit the adhesive use to protein and dextrin based adhesives.

The data submitted were insufficient to demonstrate mildew resistance of interior acrylic latex paint films. The paint should be tested according to ASTM Tentative Method D3278-73T; Testative Method of Test for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber. Copies of this method are available from American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa., 19103.

For the uses indicated under Polymer Systems in the technical data sheet, additional testing is required. Alkyd paints or other materials applied in a manner similar to paints should be tested using the method indicated above, with appropriate modifications as necessary, for interior uses. If these paints are intended for exterior use, testing must be conducted using outdoor panel tests of at least 1 year duration.

For vinyl films or other plastics, you may use ASTM Method G21-70 Standard Recommended Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi. If you intend to make a claim for controlling pink staining of vinyls, test the product according to Ford Motor Company Quality Laboratory and Chemical Engineering Physical Test Method; Resistance of Vinyls to Mildew (Pink Staining).

The types of polymer systems and their intended uses and the claims made in regard to their protection must be clarified in the labeling.

Directions for use are incomplete. Indicate the method of application or the point in the manufacturing process where the product is applied.

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