EEB BRANCH REVIEW

DATE: IN _____ OUT _____ IN _____ OUT _____ IN 4/29/76 OUT 5/14/76

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 34292-1

PETITION OR EXP. PERMIT NO. _____

DATE DIV. RECEIVED 4-8-76

DATE OF SUBMISSION 3-24-76

DATE SUBMISSION ACCEPTED _____

TYPE PRODUCT(S): I,(D) H, F, N, R, S Bacteriostatic, fungistatic, algistatic preservative for unfinished textiles

PRODUCT MGR. NO. 31

PRODUCT NAME(S) Dow Corning Q9-5700 Antimicrobial Agent

COMPANY NAME Dow Corning Corporation

SUBMISSION PURPOSE Review of additional use pattern and claim prior to formal application for amended registration.

CHEMICAL & FORMULATION

Active: 3-(trimethoxysilyl)-propyldimethyloctadecyl ammonium chloride 42%

200.0 INTRODUCTION

200.1 Uses: The registered use pattern for the subject product is as a bacteriostatic, fungistatic, and algistatic agent for preservation of unfinished (and/or intermediate) textile materials, such as fibers, fabrics, and threads. The intent of the current submission appears to be inclusion of an additional use pattern and claim, namely, inhibition of growth of odor-causing microorganisms on finished socks during use.

200.2 Background information: The current submission is considered to be a pre-application solicitation of comments, prior to formal application for amended pesticide product registration. There is no indication in the file that administrative procedures have been invoked for the amended registration process.

In regard to the registered claims for the subject product, it should be noted that the prime benefit is considered to be inhibition of growth of microorganisms associated with the actual physical deterioration of unfinished textile materials. Control of discoloration and control of odors due to the deterioration process are considered incidental benefits associated with preservation of such materials. In regard to the proposed claim, the prime benefit is solely the inhibition of growth of aesthetically undesirable, perspiration odor-causing microorganisms on finished socks when worn by the purchaser. The expected benefit is not primarily or necessarily associated with the deterioration process, but rather with the natural body process of perspiration. The purpose of this discussion is to clarify that there are two different use patterns involved, and the difference in expected benefits regarding the two use patterns.

200.2.1 Factors affecting amount/type of data required: The required demonstration of efficacy for registration of the subject chemical as an industrial preservative for unfinished textile materials (registration issued 8-4-75) was based on simple, minimal demonstration of intrinsic value as an antimicrobial preservative agent. The registrant agreed in a meeting held on January 15, 1975, and subsequently revised labeling accordingly, that all end use patterns (finished textile products), treatment levels, methods of application, etc., would be determined and supported by the user of the subject chemical. Therefore, efficacy data relative to specific textile products (such as socks), dosage concentrations, application techniques, expected benefits for such use patterns, duration of efficacy under expected use conditions, warranted claims, etc., were not provided by the registrant of the subject chemical formulation.

201.0 DATA SUMMARY

Efficacy data to support the proposed use pattern, and claim of inhibition of odor-causing microorganisms on finished socks during use, has not been provided with this submission. Such data is not provided in the data file for the basic registered chemical.

202.0 RECOMMENDATIONS

202.2 Claims not supported by efficacy data: The claim "Inhibition of odor-causing bacteria and fungi on finished socks", and this use pattern, are not supported by efficacy data.

202.3 Additional data required to support claims and achieve registration:

(a) Submit copies of the raw data, (not a summary), reported in the two studies involving (1) "a three month human wear test with _____ treated athletic socks", and (2) "a 32 day human wear test with _____ treated socks", submitted with your letter of April 5, 1976. Although in the first study, "the participating subjects were informed that the socks were treated with an antimicrobial agent which would aid in the inhibition of odor", no information concerning "odor inhibition" is reported in the results. In the second study, in Appendix 3, "LOG FOR WEAR TESTING OF SOCKS", the last column headed "Sock Odor" provides for detection of odor control. The reported results do not include any information related to sock odor. If such data are not available, results of similar in-use studies must be submitted to determine the validity of the claim pertaining to inhibition of sock odor.

(b) Simple demonstration of bacteriostatic and fungistatic activity via zones of inhibition, or otherwise, on bacterial media by impregnated materials is not sufficient to establish in-use efficacy or practical value associated with the proposed use pattern. It must be demonstrated that the expected activity and benefits of impregnation occur in/on the impregnated material itself. Since the expected benefit, inhibition of growth of odor-causing bacteria and fungi on socks, is to be of an extended or prolonged type of activity in-use (during time which sock is being worn, approximately 12-18 hours) and is to persist through multiple uses (after multiple cleaning cycles),

data are required to document this expected residual antimicrobial activity in-use, and retention of the chemical treatment and antimicrobial activity.

A simulated-use type study must be designed which will establish: (1) both the identity and the contaminant level of the microbial flora which produce odors in socks under actual use conditions, (2) initial bacteriostatic and fungistatic activity on impregnated socks, (3) if and how long such activity can be expected to persist in actual use--during time socks are being worn, (4) through how many cleaning cycles and multiple uses does the chemical treatment persist. In regard to (3) above, those in-use conditions which would be expected to adversely affect the retention (reduce the concentration of the chemical at the site of original application) and activity of the product in/on the impregnated material, in-use, should be incorporated into the study - such as abrasion, heat, repeated microbial contamination, organic load, perspiration, etc. In regard to (4) above, in addition to the in-use conditions, the effect of multiple washings with different commonly used detergents, varying water hardness, varying water temperatures, different laundry additives (such as softeners and bleach), drying, etc., must be determined.

There is no recognized standard test protocol and/or procedural study for demonstrating the above effectiveness. Therefore, it is strongly recommended that any proposed study, designed to demonstrate such effectiveness, be submitted to this Agency for comments prior to initiation of testing. As general guidance in this regard, the following basic parameters should be incorporated into the proposed study:

(1) At least three different batches/lots of subject chemical, of which at least one batch/lot is 60 days old, should be tested.

(2) Each specific type of sock intended for impregnation should be tested using each of above samples of subject chemical (example: wool socks, cotton socks, nylon socks, cotton/polyester socks, orlon/spandex socks, or whatever). The socks must be fabricated and treated using the product concentration, application techniques, finishes, etc., that would be

employed in actual commercialization process. At least five replicates of each type of sock per sample of chemical for each test performed should be used.

(3) The test organisms and inoculum load employed should be representative, as determined in the initial study discussed above. Note that any claims or representations, express or implied, concerning efficacy against potentially infectious microorganisms must be substantiated by appropriately designed clinical studies. 202.3(b) paragraph 2

(4) The test method chosen for documentation of bacteriostatic and fungistatic efficacy should be based on demonstration of activity on the fabric itself, and not on leaching of the chemical into/onto agar substrates. You may ~~which~~ wish to modify or adapt existing test procedures for your study - such as the Quinn Test, or the AATCC Method 100-1974 (9) Quantitative Procedure, or the unofficial procedure attached and designated as Enclosure A. The AATCC Method 90-1974 and the Parallel Streak Method are not acceptable, since use of these methods is contraindicated by the basic claims for the registered chemical, which are durable coupling to textiles, contact phenomenon, and non-leachability of treatment.

(5) Extensive olfactory observations regarding the development of odors on both test and control phases of the study must be included.

(6) Adequate controls must be employed for all phases of the study, and complete descriptions of fabric treatment procedures, test procedures, individual test and control results, etc., must be presented for evaluation.

The submission of results from the simulated-use laboratory tests only (referred to in 202.3(b) above), without the actual in-use study results (referred to in 202.3(a) above), would support only a claim for odor control in socks after wearing - for example - in the dirty clothes hamper or other storage area.

203.0 LABELING

203.1 Required revisions:

(1) In accordance with the registration issued 8-4-75, the phrase "For Protection of Textiles" was not accepted. The phrase must read "For Preservation of Textiles".

5

(2) If the proposed use pattern and antimicrobial activity are substantiated by the required efficacy data, the claim "Inhibition of Odor-Causing Bacteria and Fungi" must be revised as follows wherever it appears in label and bulletin: "Retards the growth of microorganisms, on finished (type of) socks, that act on perspiration to cause unpleasnat odors".

(3) The paragraph in Bulletin 19-015 entitled "Primary Use" should be revised as follows:

> "Provides preservation for many types of fibers, fabrics, and threads against a wide variety of bacteria, algae, fungi, and yeasts. Retards the growth of microorganisms, on finished (type of) socks, that act on perspiration to cause unpleasant odors."

(4) The Dow Corning Bulletin 19-015 must include a special section which provides explicit directions for use for impregnation of specific types of socks, expected activity, duration of activity, duration of activity in-use, washing instructions, and all other information pertinent to the manufacture of such impregnated socks, and the efficacious use of such socks by the end purchaser, as reflected in the efficacy data to be submitted.

(5) If the product label is amended to include the proposed claim and use pattern, copies of such revised label must be submitted.

(6) If efficacy is substantiated, the label claims and marketing representations for the treated (impregnated) socks must not exceed the following:

> "Treated to retard the growth of microorganisms on the socks that act on perspiration to cause unpleasant odors."

In addition, the labeling for the treated socks must provide the appropriate wash and care instructions that are necessary to insure retention of the chemical treatment and must indicate the expected life of the claimed activity (such as the number of washings).

(7) Claims such as "Controls foot odor", "Inhibits foot odor", or any implecation that the product or treated socks will prevent or control "Athlete's Foot", will not be accepted,

in accordance with the provisions of FIFRA, as amended. Such claims imply treatment of feet and/or antimicrobial activity on the feet, and as such, should be considered under the purview of the Federal Food, Drug, and Cosmetic Act and regulated by the U.S. Food and Drug Administration.

Doris Jean Jenkins 5/14/76
Efficacy Section
Efficacy and Ecological Effects Branch

WSW JKS