Designation: E 938 – 94

Standard Test Method for Effectiveness of Liquid, Gel, or Cream Insecticides Against Adult Human Lice[1]

This standard is issued under the fixed designation E 938; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method determines the effectiveness of pediculicidal materials in liquid, gel, or cream form, against the adult human louse, *Pediculus humanus*, the surrogate subspecies for the human head louse (*P.h. capitis*). (Only gels or creams that liquefy at 32°C (90°F) can be tested).

1.2 This test method is for the use of those wishing to develop efficacy data, or to compare formulations for head louse control.

1.3 This test method consists of five replicates for a statistical comparison of formulations.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Terminology

2.1 *Descriptions of Terms Specific to This Standard:*

2.1.1 *morbid*—unable to move towards heat 1 h after treatment: sickly, but not necessarily dying; may recover by 24 h.

2.1.2 *moribund*—unable to move towards heat (and therefore food) 24 h after treatment; dying.

3. Summary of Test Method

3.1 Five replicates of 25 lice each, plus five control replicates for each batch of lice, shall be used for each test concentration or any other variable tested.

3.2 Percent mortality, corrected by Abbott's Formula, is determined.[2]

4. Significance and Use

4.1 This test method should provide a consistent approach both in terms of test insects and test procedures for the gathering of efficacy data for pediculicides.

4.2 Data collection in this manner should be suitable for product development and comparison. In addition, it should be suitable for review by regulatory agencies.

5. Apparatus and Materials

5.1 *Test Container*—A 9-dram plastic vial, screened at the bottom with 20-mesh screen, shall be used as the dipping vessel. A plunger, made from a plastic rod, and a circular screen fits inside the vial. Plastics used should be as chemically unreactive as possible. Plastic vials are to be discarded after each test.

5.2 *Beakers*—A 100-mL beaker is used to contain the insecticide into which the test container is dipped. A1000-mL beaker is used as the container in which the lice are washed after treatment.

5.3 *Heating Surface*—A slide dryer, that will provide heat of approximately 37°C (98°F), is adequate.

5.4 *Incubator*—The incubator shall be capable of maintaining a temperature of 31.7°C (89°F) and 60 % RH.

5.5 *Petri dishes*, 8.9 cm in diameter and 1.3 cm deep.

5.6 *Waterbath*—Capable of maintaining 32°C (90°F).

5.7 *Dark Cotton Corduroy*, 4 by 4 cm.

5.8 *Paper Toweling, Stop Watch, Forceps or Camel Hair Brush*, and *Wash Bottle*.

5.9 *Test Insect*—The test insect is the human body louse, *Pediculus humanus humanus.* The present strain was established from the USDA Gainesville strain.[3] It is a susceptible strain and, through selection, has adapted to a rabbit host.

5.10 *Host Animal*—New Zealand white rabbits.

6. Rearing of Test Insects

6.1 Collect eggs at 2-day intervals. This can be done when the corduroy patch is placed on the rabbit. The adult lice leave the patch to feed. The patch is then removed from the rabbit. Any lice that do remain on the patch, should be removed.

6.2 Place the patch containing eggs in a plastic container (10 by 7 cm) with a screened lid, and note the date on the container. Place the container in an incubator that is maintained at 31.7°C and 60 % RH.

[1] This test method is under the jurisdiction of ASTM Committee E-35 on Pesticides and is the direct responsibility of Subcommittee E35.12 on Insect Control Agents.

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[2] Abbott, W. S., "A Method of Computing the Effectiveness of An Insecticide," *Journal of Economic Entomology*, Vol 18, 1925, pp. 265–267.

[3] The present strain of *Pediculus humanus humanus* is maintained by Insect Control and Research, Inc., Baltimore, MD 21228.