8.3 **LIQUID VAPORIZERS**

Note for preparation of draft specifications. Do not omit clauses or insert additional clauses, nor insert limits that are more lax than those given in the guidelines, without referring to Section 4. From the “Notes” provided at the end of this guideline, incorporate only those which are applicable to the particular specification.

**...... [ISO common name] LIQUID VAPORIZERS**

[CIPAC number]/LV (month & year of publication)

The material, sampled from any part of the consignment in accordance with the procedure described in Note 1 or any other acceptable procedure, shall comply with the specification.

8.3.1 **Description**

The product shall consist of a liquid insecticide formulation in a cartridge/bottle (Figure 1), designed to fit a suitable heater unit (Note 2), and the formulation shall be effective as it passes up the heated wick and evaporates at a suitable rate, over the period claimed by the manufacturer. The cartridge/bottle shall be designed to minimise the risk of accidental ingestion of the contents. The ...... [ISO common name] technical material used in the manufacture of the liquid vaporizer shall comply with the requirements of WHO specification ......

8.3.2 **Active ingredient**

8.3.2.1 **Identity tests** (Note 3)

The active ingredient shall comply with an identity test and, where the identity remains in doubt, it shall comply with at least one additional test.

8.3.2.2 **...... [ISO common name] content** (Note 3)

The ...... [ISO common name] content shall be declared (g/kg or g/l at 20 ± 2 °C, Note 4) and, when determined, the average content measured shall not differ from that declared by more than the appropriate tolerance, given in the table of tolerances, Section 4.3.2.

8.3.3 **Relevant impurities**

8.3.3.1 **By-products of manufacture or storage** (Note 5), if required

Maximum: ..….% of the …… [ISO common name] content found under 8.3.2.2.

8.3.4 **Physical properties**

8.3.4.1 **Cartridge/bottle**

The cartridge/bottle:

1. shall be made of a suitable heat-resistant material;
2. shall be of a suitable shape and size to fit the heater unit for which it was designed;
3. shall hold the wick firmly, with a stopper preventing spillage should the cartridge/bottle be inverted with the covering cap;
4. shall have a child-proof cap.

8.3.4.2 **Wick**

The wick:

1. shall be made of a suitably porous heat-resistant material;
2. shall draw up sufficient insecticide formulation, when heated at one end, for vaporisation to provide a suitable level of protection against mosquitoes;
3. shall be of material and design such that it can vaporise the total content of the insecticide formulation in the bottle/cartridge to which it is attached.

8.3.4.3 **Vaporization rate**

The wick and cartridge/bottle shall be designed and constructed such that the insecticide formulation vaporizes from the heated end of the wick at a constant, or close to constant, rate to enable a constant rate of active ingredient emission throughout the minimum effective period (8.3.4.4). (Note 6)

8.3.4.4 **Minimum effective period** (Note 6)

The minimum effective period shall be declared and the cartridge/bottle shall hold sufficient formulation to enable the product to function for not less than the minimum effective period declared.

8.3.5 **Storage stability**

8.3.5.1 **Stability at elevated temperature (MT 46.4)**

After storage at 54 ± 2 ºC for 14 days (Note 7), the determined average active ingredient content must not be lower than ......% relative to the determined average content found before storage (Note 8) and the formulation shall continue to comply with the clauses for:

- by-products of manufacture or storage (8.3.3.1),

- minimum effective period (8.3.4.4).

as required.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Note 1 Sampling

*General requirements*

a) Samples shall be stored in such a manner that there is no deterioration of the material.

b) The sampling instrument shall be clean and dry.

c) Samples shall be protected against contamination.

*Sampling, testing and acceptance*

a) In any consignment, all the master cartons containing liquid vaporizer refill bottles of the same type shall constitute a lot.

b) Samples shall be drawn from each lot and individually tested to ascertain whether the material complies with the specified requirements.

c) Any sample failing to comply with the specified requirements shall be termed as defective. The acceptance number shall be the maximum number of defective samples permissible for a lot to be accepted.

d) The number of refill bottles to be drawn from the lot and the acceptance number shall be as shown in the following Table.

|  |  |  |
| --- | --- | --- |
| Total number of containers in lot | Number of containers to be tested | Acceptance number |
| 300 or less  301 to 1200  1201 to 2000  2001 to 7000  7001 to 15000  15001 to 24000  24001 to 41000  over 41000 | 3  6  13  21  29  48  84  126 | 0  1  2  3  4  6  9  13 |

e) Each of the refill bottles to be tested shall be drawn from a different master carton which shall be selected at random. In order to ensure randomness of selection, random number tables shall be used. If such tables are not available, the following procedure may be adopted.

Starting from any master carton, count the master cartons as 1, 2, 3...... r in a systematic manner. Every rth carton shall be drawn, r being the integral part of N/n, where N is the total number of master cartons in the lot and n the number of master cartons to be selected.

Note 2 The heating unit must comply with all relevant national safety standards.

Note 3 Method(s) of analysis must be CIPAC, AOAC or equivalent. Where methods have not yet been published, full details and appropriate method validation data must be submitted to FAO/WHO by the proposer.

Note 4 If the buyer requires both g/kg and g/L at 20± 2oC, then in case of dispute the analytical results shall be calculated as g/kg.

Note 5 This clause should include only relevant impurities and the title should be changed to reflect the name of the relevant impurity. The method(s) of analysis must be peer validated.

Note 6 Determination of the minimum effective period of a refill bottle of a liquid vaporizer. No suitable test methods are available.

Note 7 Unless other temperatures and/or times are specified. Refer to Section 4.6.2 of this Manual for alternative storage conditions.

Note 8 Samples of the formulation taken before and after the storage stability test should be analysed concurrently after the test in order to reduce the analytical error.

**Figure 1. Diagram of the structure of mosquito electric liquid vaporizer (refill bottle and its heating device)**

