WHO Prequalification of Vector Control Products

Phys/Chem tests for ITNs: Determination of mesh size

1. Purpose

The applicant must submit the physical characteristics of each fabric used in the construction of an insecticide-treated net (ITN). This includes supporting data to verify the declared mesh size value and determine the potential inter-/intra-batch variability.

2. Determining netting mesh size

In the absence of a simple or standard method to determine the size of holes, which may have complex shapes, in highly flexible fabrics, mesh size is determined by counting the number of holes in a square of the fabric. Counting may be done directly on the fabric or indirectly by taking a picture/photocopy of the fabric. Indirect methods may ease counting and provide a permanent record. The number of holes per measured area is converted in holes/cm^2. Before counting, the fabric should be conditioned according to ISO 139 (4 h, 20ºC, 65% relative humidity).

Use a template to define the square of netting, taking care not to stretch or distort the fabric. The template should be a 1-2 mm thick rigid sheet, in/on which an accurately calibrated (±1% in each dimension) square, e.g. 1 x 1 in or 5 x 5 cm, has been cut/marked.

Appropriate template size depends on each net type. Note the suitable template size. If a template is not available and a ruler must be used, great care is required to ensure that the area counted is square. Where practicable, one edge of the square to be counted should be aligned with a row of complete holes in the fabric.

Incomplete holes ≥ ½ are counted as complete holes, whereas those < ½ are not counted. Count 4 replicate squares selected according to Implementation guidance: Declaration of ITN construction and sampling, calculate the average, and note the lowest value per batch.

Another suitable method is the use of a stereomicroscope with an image analyser software, where the number of holes in a defined area is counted. If this method is used, information on the software and settings must be included *(1)*.

3. Related documents

- WHO PQT/VCP Implementation Guidance - Declaration of ITN Construction and Sampling Procedure
- Physical testing requirements for ITNs: Accreditation and compliance with international standards for the generation of data intended to be submitted to WHO prequalification

4. References

1. Manual on the development and use of FAO and WHO specifications for chemical pesticides – Second edition. Rome: Food and Agriculture Organization of the United Nations and Geneva: World Health Organization; 2022 (https://iris.who.int/bitstream/handle/10665/373945/9789240049093-eng.pdf, accessed 13 December 2023).