

## 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<sup>2</sup>. Before counting, the fabric should be conditioned according to ISO 139 (4 h, 20°C, 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 ( $\pm 1\%$  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  $\geq \frac{1}{2}$  are counted as complete holes, whereas those  $< \frac{1}{2}$  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

### 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).