WHO Prequalification of Vector Control Products

Phys/Chem tests for ITNs: Flammability

1. Purpose

For each fabric used in the construction of a proposed ITN, the applicant must submit data to characterize the potential flammability hazard.

2. Determining flammability

Flammability is a function of the formulation. It must be tested according to EN 1102 *(1)*. The following requirements should be achieved:

After removing the ignition source the following fire phenomena should not occur:

- ignition
- propagation of the flame or glow.
- flaming debris
- ignition of the filter paper

Fulfilling the above requirements means that the flame speed rate is 0 mm/s, i.e., no flame or glow achieves first and third marker threads.

Characterization of the hole formed during the test as a result of burning and/or melting must be included. Generally, the width and length of the hole should not exceed 50 mm and 150 mm, respectively.

The following observations shall be reported: the afterflame time, the afterglow time, the maximum damage width and length, whether or not flame reaches vertical edge of the sample, whether or not a hole is burnt or melted in the sample, whether or not any flaming debris falls below the bottom edge of the sample and ignition of the filter paper *(2)*.

3. Considerations for Use of the Method

3.1.Terminology

Definitions according to ISO 4880:1997 *(3)* (not included in EN 1102:2016 *(1)* and ISO 6941:2003 *(4)*):

- **Ignition**: initiation of combustion.
- **Combustion**: exothermic reaction of a combustible substance with an oxidizer, accompanied by flames and/or glowing and/or emission of smoke.

4. Sampling and test samples

Sampling procedure for ITNs is dependent on the design and construction of the ITN, including the presence of multiple fabrics in the ITN design. The sampling procedure is declared in the Implementation guidance: Declaration of ITN construction and sampling and must ensure that any differing fabrics in the ITN are adequately represented. The total number of samples required is dependent upon the study and the product.

For the data generation for PQ Module 3 dossier on flammability of ITNs, one ITN per batch from five batches, and one sample per fabric type per ITN are required for testing.

5. Procedure for measuring damage width and length dimensions of each sample

Remove the sample from the sample holder and place it on a flat horizontal surface. Place a rule on top of the test sample along the line of maximum damage and parallel with the length side of the test sample. Measure the maximum length in millimetres from the lowest point of damage to the end of the hole. To measure the damage width, proceed in the same way but with the ruler parallel to the width side of the test sample. Proceed in the same way for all samples *(2)*.

6. Related documents

- WHO PQT/VCP Implementation Guidance - Declaration of ITN Construction and Sampling Procedure
- WHO PQT/VCP Implementation Guidance - Declaration of ITN Construction and Sampling – Template
- WHO PQT/VCP Implementation Guidance - Data Requirements Table – Module 3

7. References

When using the normative references for physical tests, the updated version of the standard should always be used when available.

1. British Standards Institution. BS EN 1102:2016. *Textiles and textile products. Burning behaviour. Curtains and drapes. Detailed procedure to determine the flame spread of vertically oriented specimens*. London: BSI group; 2016.
2. 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).
3. International Organization for Standardization. ISO 4880:1997. *Burning behaviour of textiles and textile products - Vocabulary*. Geneva: ISO; 1977.
4. International Organization for Standardization. ISO 6941:2003. *Textile fabrics — Burning behaviour — Measurement of flame spread properties of vertically oriented specimens*. Geneva: ISO; 2003.