

**National Vector Borne Disease Control Programme
Directorate General of Health Services
Ministry of Health & Family Welfare,
Govt. of India**

14.10.2021

Technical Specifications for Long Lasting Insecticidal Nets

Long Lasting Insecticidal Nets (LLINs) must be registered in India with Central Insecticide Board (CIB) under Insecticide Act, 1968.

1. Dimensions

The LLINs shall conform to the following dimensions: -

Size-I

Length : 180±5cm
Width : 100±4cm
Height : 150±5cm

Size-II

Length : 180+5cm
Width : 130+5cm
Height : 150+5cm

Size-III

Length : 180±5cm
Width : 160±5cm
Height : 150±5cm

2. Other Specifications for netting:

(2.1). Physical

- a. **Netting weight (Gram per square meter):** 40-60
- b. **Denier** : 100-150
- c. **Bursting strength** : Minimum 350 kPa
- d. **Number of holes** : Minimum 8 holes per sq. cm /50 holes per sq. inch
- e. **Colour** : Pink/Yellow/Blue/Khaki/White/Green

(2.2). Biological efficacy

(a). Laboratory: Biological activity of the LLINs on mosquitoes on bioassay after 20 standard washes in laboratory should not show less than 95% knockdown (recorded after 60 minutes following exposure for 3 minutes) OR less than 80%

mortality (recorded after 24 hours holding period following exposure for 3 minutes) as per WHO guidelines for laboratory and field testing of long-lasting insecticidal nets 2013.

(b). Field use: Biological activity of the LLINs on mosquitoes on bioassay after 3 years of recommended use in field conditions should not show less than 95% knockdown (recorded after 60 minutes following exposure for 3 minutes) OR less than 80% mortality (recorded after 24 hours holding period following exposure for 3 minutes) as per WHO guidelines for laboratory and field testing of long-lasting insecticidal nets 2013.

(2.3). Dimensional Stability of netting to Washing: Not more than 5% shrinkage/ expansion in both directions.

(2.4). Flammability: Non-inflammable as per IS 11871-1986 (Reaffirmed year: 2018) / EN 1102:2016 / CIPAC 16-CFR 1610.

(2.5). Storage Stability: The insecticide content in the LLINs should not be less than 95% of the active ingredient as per original product claim after storage at 54 ± 2 degree centigrade for two weeks for Alpha-cypermethrin/ permethrin-based nets; and 40 ± 2 degree centigrade for eight weeks for deltamethrin based nets.

(2.6). Active Ingredient content: Target dose should be (i) Alpha-cypermethrin based nets- 5.8 gm/kg ($\pm 25\%$); (ii) Deltamethrin based nets - 1.4 gm/kg ($\pm 25\%$); (iii) Permethrin based nets - 20 gm/kg ($\pm 25\%$).

3. Manufacture and Workmanship:

a. **Wall and Top**

The top shall be made from single piece of netting for all sizes of mosquito nets. The walls shall be made from one piece of netting and shall be closed with lapped seam and the seam shall be at one of the corners. One edge of the netting of the wall shall be attached to the netting at the top by means of a plain seam.

b. **Tying loops**

The nets shall be provided with same fabric stitched tying loops, four in size-I and six in size II & III of LLINs. The loop shall be 15 mm wide and 15 cm long and shall be made of same fabric as of the wall and top.

c. **Stitching**

The nets shall be made with lock stitch of even tension throughout, and loose ends securely fastened off. The number of stitches per decimeter shall be 30 to 38. The stitching shall be made by using polyester multifilament sewing thread of matching shade.

4. **Marking:**

a. **Standard Mark**

The LLINs shall bear the Standard Mark in permanent ink- “**CIB – Registered**” and “**NVBDCP Supply- Not for Sale**” either machine printed or tagged on the top of two opposite sides of the net. In case of tags (2 numbers) the size of the tags should be 10X15 cm, placed on the top seam of the net. In case of machine print, the print shall be done in a continuing process/running all along the sides of the net, 10 cm below the top edge.

- i. The following information shall be indelibly marked on cloth label securely stitched at any top corner of the net: Size of the net namely length (cm), width (cm), height (cm).
- ii. Name of fibre/fabric of netting and its variety number.
- iii. Batch number; and month & year of Manufacturing.
- iv. Any other information mentioned in Contract/PO/Statutory provisions.
- v. The above information along with number of pieces shall also be printed/stencilled on each bale.

5. **Packing:**

- a. LLIN should be packed as per CIB prescribed norms on packaging as mentioned in the registration certificate of the product.
- b. Packaging of individual LLIN shall be done in a biodegradable pack.
- c. Each net shall be provided with one pictorial guidelines on single A4 size sheet highlighting DO's and DON'T's (two different languages on each side of A4 size sheet) for community awareness on usage of LLINs. The guidelines are to be kept inside of each individual LLIN packing.

6. **Sampling of LLINs**

- Sampling of LLINs for testing as per ISO 2859-1 as amended from time to time with inspection level -1.
- Acceptable Quality Level (AQL) shall be, for major defect as per 4.0 and minor defect 6.5.

Note: These specifications are wide and generic and not specific to any particular manufacturer or vendor or supplier.
