

Indian Standard

TEXTILES — TUBULAR NYLON TAPES FOR AEROSPACE APPLICATIONS — SPECIFICATION

(Second Revision)

1 SCOPE

This standard covers requirements for two types of tubular nylon tapes used in the aerial delivery equipment including personnel parachutes.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions, indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

3 TYPES

Based on the ~~thickness and GSM~~ tubular nylon tapes are classified as follows:

- a) Type I — ~~having Max 39 GSM and 2.3 mm thickness under a pressure of 200 g/cm²; and~~ *breaking load*
 having Min breaking load of **13377 N**
- b) Type II — ~~having Max 12 GSM and 2.3 mm thickness under a pressure of 200 g/cm².~~
 having Min breaking load of **2352 N**

4 MATERIALS

4.1 The following high tenacity nylon yarns made out of nylon-66 or nylon-6 may be used in the manufacture of nylon tubular tape and number of plies in the yarn shall be as follows:

Sl No.	Type	Denier × Ply of Warp Yarn	Denier × Ply of Weft Yarn	Tenacity, g/Denier (gpd), Min
(1)	(2)	(3)	(4)	(5)
i)	Type I	840 × 2 or 1680 × 1	840 × 1	8.5
ii)	Type II	210 × 1	210 × 5 or 1 050 × 1	6.5
Tolerance, percent		± 10		
Method of test, Ref to		IS 4910 (Part 2)		IS 1670

4.2 The nylon yarn shall be bright, light and heat resistant and have melting point not less than 247 °C for nylon 66 and not less than 215 °C for nylon-6.

NOTE — In order to ascertain whether nylon-66 or nylon-6 is used the method of test for the determination of melting point as per IS 5762 may be followed.

4.3 The twist in the final ply shall not be less than 100 tpm when tested as given in IS 832 (Part 1).

4.4 The nylon yarn shall be free from stains, finishing and dressing materials.

5 REQUIREMENTS

5.1 The finished nylon tape shall meet the requirements given in Table I.

5.2 Residual Shrinkage

The residual shrinkage of the nylon tubular tape shall not exceed 2.0 percent when tested in accordance with IS 2977.

5.3 Resistance to Accelerated Ageing

The tubular nylon tape shall not lose more than 25 percent of its original breaking strength when subjected to treatment for accelerated ageing given in Annex E of IS 4727.

5.4 The tubular nylon tape shall not lose more than 25 percent of its original breaking strength after being kept in an oven for one hour at 180 °C ± 3 °C and subsequently conditioned as given in IS 6359.

5.5 Sealed Sample

If in order to illustrate or specify the characteristics like general appearance, colour, feel, etc, of the tubular nylon tape, a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in such respects.

Table 1 Requirements for Tubular Nylon Tape for Aerospace Applications

(Clause 5.1)

SI No.	Characteristic	Requirement for		Method of Test, Ref To
		Type I	Type II	
(1)	(2)	(3)	(4)	(5)
i)	Length of roll	100 m, or as required by the buyer. 10 percent of the supplies may be made in short length pieces subject to the condition that short length pieces are 20 metre or its multiples.		IS 1954
ii)	Width, mm Tolerance, mm	— 25 (+ 2, - 0) —		
iii)	Thickness, mm, <i>Max</i> under a pressure of 200 g/cm ²	2.3	1.5	IS 7702
iv)	Ends in full width, <i>Min</i>	140	206	IS 1963
v)	Picks/dm, <i>Min</i>	200	170	
vi)	Mass, g/m ² , <i>Max</i> (see Note 1)	39	12	IS 1964
vii)	Breaking load in full width × 20 cm between grips, N, <i>Min</i> (see Note 2)	13 377	2 352	IS 1969 (Part 1)
viii)	Elongation at break, <i>Min</i> , percent (see Note 2)	18		
ix)	Weave	Tubular, plain 1/1		—
x)	Colour fastness to light	5 or better		IS/ISO 105-B01 or IS/ISO 105-B02
xi)	Colour fastness to washing	4 or better		IS/ISO 105-C10 [Test Number A (1)]
xii)	pH	5.5 to 8.5		IS 1390

change
g/m²
to
g/m

NOTES

1 Prior to cutting test specimens for mass (g/m²) test, the nylon tubular tape shall be subjected to a tension equal to its one percent specified minimum breaking load for 60 s ± 5 s on a breaking load testing machine.

2 In case of dyed webbing, + 5 percent relaxation shall be allowed in mass and extension at break.

6 PACKING

6.1 Unless otherwise agreed to between the buyer and the seller, the tubular nylon tapes shall be packed as given in 6.2.

6.2 An appropriate number of rolls shall be arranged in a cylindrical bundle and secured by 3 ply jute twine (see IS 1912) to form a pack. A suitable number of such packs shall be arranged and wrapped with polyethylene film of at least 100 microns thickness (see IS 2508) and placed in a wooden packing case of adequate strength, previously lined with one layer of waterproof packing paper

conforming to Type 2 of IS 1398. The empty spaces, if any, in the packing case shall be stuffed with cushioning materials to avoid damage in transit. The case shall be bound by iron hoops or wires. The gross mass of the case shall not exceed 40 kg.

7 MARKING

7.1 Each roll shall provide the following information on a label attached to it:

- Length (m), width (mm) and thickness (mm);
- Date of manufacture in a suitable code;