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उत्पाद मैनुअल

वस्त्रादि — सतत तंतु पॉलियामाइड (नायलॉन 6) के धागे

IS 7867:2024 के अनुसार

PRODUCT MANUAL FOR Textiles — Continuous Filament Polyamide (Nylon 6) Yarn ACCORDING TO IS 7867:2024

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards(Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification.

1.	मानक संख्या IS No.	:	IS 7867:2024
	शीर्षक Title	:	Textiles — Continuous Filament Polyamide (Nylon 6) Yarn
	संशोधनों की संख्या No. of amendments	:	NIL
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No Specific Requirement Note: This section indicates the requirements for raw material(if specified in the IS)for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.

b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer to Annex-A
c)	नमूने का परिमाण Sample Quantity	:	05kg approx. in 03 bobbins Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer to Annex-B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer to Annex-C
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	The following tests are possible to be carried out in a day, provided the conditioned samples are available: i. Identification and description (Clause 4) ii. Cross-section of yarn (Clause 5.1 and Table 2/3/4) iii. Linear Density (Denier) (Clause 5.1 and Table 2/3/4) iv. No. of Filaments in Multifilament Yarn (Clause 5.1 and Table 2/3/4) v. Tenacity and Yarn Elongation at Break (Clause 5.1 and Table 2/3/4) vi. Moisture Regain (Clause 5.1 and Table 2/3/4) vii. Boiling water Shrinkage (Clause 5.1 and Table 2/3/4) viii. Water Soluble Matter (Clause 5.1 and Table 2/3/4) ix. Colour Strength for Dope Dyed Yarn (Clause 5.1 and Table 2/3/4) x. Freedom from yarn defects (Clause 5.2) xi. Commercial Mass (Clause 5.3) Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies(OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	लाइसेंस का दायरा/Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 7867:2024 with the following scope:		
	Name of the product	Textiles — Continuous Filament Polyamide (Nylon 6) Yarn	
	Type of Yarn	Flat Yarn(FDY, HOY, DW, Mother Yarn, Mono Yarn)/High Tenacity Yarn/ Partially Oriented Yarn	
	Type of yarn Based on Cross-Section	• Cross sectional view - Circular, trilobal, triangular, slit, octa lobal Solid, Hollow etc.	

	Type of Yarn Based on Lustre	• Full dull (FD), • Semi dull (SD)/ Semi Dull Optically Bright (SDOB), • Bright (BRT)/ Optically Bright (OBRT)
	Dyeing Method	Dope Dyed/ Undyed
	Declared Values (range) of	Linear Density
	Optional Requirement	• Flame Retardant/Non-Flame Retardant; • Anti-Microbial/ Non Anti-Microbial; • Ultra Violet light Resistant/ Non-Ultra Violet light Resistant;

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ANNEX-A

GROUPING GUIDELINES

- 1) Based on the classification and identification of the product, the following grouping guidelines shall apply for Grant of Licence and Change in Scope of Licence
 - i. The sample of each type of Yarn (Flat Yarn/ High Tenacity Yarn/ Partially Oriented Yarn) shall be drawn and tested to cover the same in the scope of licence. Further, in case of Flat yarn, each type i.e. FDY, HOY, DW, Mother Yarn and Mono Yarn shall be drawn and tested separately to cover in the scope of licence.
 - ii. One sample of Continuous Filament Polyamide (Nylon 6) Yarn of any type of yarn based on cross section shall be tested to cover all types of yarn based on cross section intended to be covered in the licence
 - iii. Separate samples based on lustre shall be drawn and tested to cover these varieties in the scope of licence.
 - iv. If sample of dope dyed Continuous Filament Polyamide (Nylon 6) Yarn has been tested, undyed yarn may also be covered in the scope of license.
 - v. The range of values of linear density of Continuous Filament Polyamide (Nylon 6) Yarn intended to be covered in the scope of licence shall be declared by the manufacturer within the specified range. One Sample of Continuous Filament Polyamide (Nylon 6) Yarn of any declared value of Linear Density shall be drawn and tested to cover the entire range of linear density values intended to be covered in the scope of licence
 - vi. In case optional requirements of Flame retardant, Anti – microbial, and Ultra violet light resistant Continuous Filament Polyamide (Nylon 6) Yarn are intended to be covered in the scope of licence, the same shall be tested for these requirements as applicable.
- 2) Scope of licence shall be restricted based on the manufacturing and testing facilities available.
- 3) During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible.

ANNEX-B

LIST OF TEST EQUIPMENTS

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Tests Used In With Clause Reference	Test Equipment/Chemical
1	Identification and Notation of Polyamide (Nylon 6) Yarns, Cl 4	Microscopic and dissolution test given in IS 667: Compound Microscope (100X-500X), Dissecting Needles, glass slides, cover glasses, and cross sectioning device and laboratory reagents as per IS 667 Or Determination of Melting Temperature as per Annex B of IS 7867: Differential Scanning Colorimeter (DSC) as per specification mentioned in Clause B-3.1 of IS 7867, Balance, capable of weighing to $\pm 10 \mu\text{g}$
2	Identification and Notation of Polyamide (Nylon 6) Yarns, Cl 4	Determination Of Melting and Glass Transition Temperatures Differential Scanning Colorimeter (DSC) Balance — capable of weighing to $\pm 10 \mu\text{g}$
3	Cross section, Clause 5.1 and Table 2/3/4	Microscope with magnification of minimum 100X
4	Linear density (Denier) Clause 5.1 and Table 2/3/4	- Conditioning Chamber - Weighing Balance (L.C.- 0.1 mg) - Drying Oven ($>110^{\circ}\text{C}$, L.C. 1°C) - Desiccator with a suitable desiccant - Sealed Containers - Wrap Reel
5	No. of filaments, Clause 5.1 and Table 2/3/4	Visual inspection under microscope
6	Interlace as nips/meter, Clause 5.1 and Table 2/3/4	Determination of Interlace in Filament Yarn By Needle Insertion Method - Automatic needle pull entanglement tester, Rapid Automatic Pin Insertion Detector and automatic yarn entanglement tester - Conditioning Chamber - Standard Laboratory weights Or Optical Scanning Principle - Nips Stability Tester Or Determination Of Interlace of Filament Yarn in Nips Per Metre By Water Bath Method - Water bath with hooks at both ends for tying the yarn.

		One metre stainless steel scale with 1 mm least count
7	Tenacity(gpd) and Elongation at Break (Dry Method), Clause 5.1 and Table 2/3/4	Tensile Strength Testing Machine either of CRT, CRL or CRE type, with clamps to grip the sample and means for adjusting the distance between the clamps and for application of pre-tension.
8	Boiling water shrinkage, Clause 5.1 and Table 2/3/4	Hot Water Bath with capacity to completely immerse the magazine. Magazine to hold the hanks/skeins. Weights of 50 g to 500 g. Stainless Steel Scale of one metre length Wrap reel to prepare skein. Metal hooks to take lengths L1 and L2 readings.
9	Spin finish oil pick-up, percent, Clause 5.1 and Table 2/3/4	Precision Balance (L.C.- 0.1mg) Stainless Steel Vessels Conical Flasks Forceps Petroleum Ether Soxhlet Apparatus Bowls
10	Unevenness of linear density (normal), Clause 5.1 and Table 2/3/4	Capacitance type Unevenness testing Instrument (such as Uster unevenness tester) with packing holders, guides, tension devices and take up mechanism, Recorder. – Conditioning Chamber (for 65±2 RH and 27±2 °C)
11	Lustre, titanium dioxide content, Clause 5.1 and Table 2/3/4	- PPE like Safety Goggles, Nose Mask and Apron. - Analytical Balance (LC-0.1mg) - UV Visible Spectrophotometer - Sili Volumetric-100ml, 500ml, 1000ml - Muffle furnace (Capable of maintaining temperature 700°C to 800°C and accepting 7 to 8 cm dishes.) - Tongs, Hot Plate (Capable of being heated to 250 to 300°C) - Measuring cylinder (10 to 50 ml capacity), - Glass beakers (250 ml capacity) - Reagents- Hydrogen Peroxide, Sulphuric Acid, Nitric Acid, Ammonium Sulphate, Titanium Dioxide
12	Moisture regain, percent, Clause 5.1 and Table 2/3/4	- Precision Balance(L.C- 0.1mg) - Stainless Steel Vessels - Hot Air Oven Capable of Maintaining at 110 ± 5°C - Forceps - Wrap Reel
13	Water soluble matter, percent, Clause 5.1 and Table 2/3/4	- Distilled Water - Water Cooled Condenser - Hot Air Oven - Flat Bottom Flasks - Weighing Balance, with a resolution of 0.1 mg
14	Limiting oxygen index (for fire retardant yarns only), Clause 5.1 and Table 2/3/4	- Test Chimney - Test Specimen Holder - Gas Supply (commercial grade Oxygen and Nitrogen)

		• Gas measurement and control device • Flame Igniter • Soot, Fumes and Heat Extraction system • Conditioning Chamber (for 65±2 RH and 27±2 °C)
15	Ultraviolet resistance, UVB lamp, 144 h (for UV resistant yarn only), Clause 5.1 and Table 2/3/4	• fluorescent UV-B lamp • Tensile Testing machine
16	Anti-microbial activity value, (for anti-microbial yarn only), Clause 5.1 and Table 2/3/4	Apparatus/ Equipments as per IS/ISO 20743: • Spectrophotometer • Incubator • Water baths • Mixer • Stomacher • Clean Bench • Washing Machine • Humidity chamber • Luminescence Photometer • Printing Apparatus • Refrigerator • Freezer • Balance • Filtering Apparatus • Pipette, Vials, Glass Bottles • Petri Dishes • Glass Rod • Anti Bumping Granules • Erlenmeyer Flask • Cutting template • Disposable Plastic Bag • Tweezers • Stainless Steel Cylinders • Metal Wire Basket • Aluminium Foil • Reciprocal Incubation Shaker • Autoclave • Reagents and Culture media as per clause 6 • Reference Strains as per clause 7
17	Colour strength with reference to standard yarn, percent (for dope dyed yarns only), Clause 5.1 and Table 2/3/4	• Card Winding Machine with uniform tension control system • Scanning Spectrometer • Card(Aluminium) • Clean Cotton Cloth
18	Colour difference with reference to standard yarn, measured as ΔE , (for dope dyed yarns only), Clause	• Card Winding Machine with uniform tension control system • Scanning Spectrometer • Card(Aluminium)

	5.1 and Table 2/3/4, Clause 5.1 and Table 2/3/4	• Clean Cotton Cloth
	Colour fastness to light (for dope dyed yarns only), Clause 5.1 and Table 2/3/4	• For Colour Fastness to Daylight (as per IS/ISO 105-B01: 2024 (Superseding IS 686 : 1985) • Source of Daylight • Reference materials • Exposure Rack • 19Opaque Cardboard • Grey Scale for Measuring change in colour • or - For Colour Fastness to artificial light (as per IS/ISO 105-B02 : 2014(Superseding IS 2454 : 1985)) • Reference materials • Humidity test control fabric • Light Source (xenon arc lamp) • Black-standard thermometer or a black- panel thermometer • Humidity chamber • Covers • Colour matching lamps • Assessment cabinet • Sample mounting card • Assessment mask
20	Freedom from yarn defects, Clause 5.2	• Packing Table UV Light(Clause 5.2.4 and 5.2.7) • Vernier Calliper
21	Commercial Mass, Clause 5.3	• Balance/Weighing Instruments(LC-.1mg) • Air tight vessels/Desiccator • Hot air oven/Ventilated air oven • Laboratory reagents for Cleaning Specimens

ANNEX C

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: the entire quantity of Continuous Filament Polyamide (Nylon 6) Yarn, of each variety manufactured under similar conditions in a single day.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as "R" or other tests which can be subcontracted as "S". Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as "R" in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each carton/pallet of Continuous Filament Polyamide (Nylon 6) Yarn, provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 Additional Marking requirements: The material shall also be marked with the following additional requirement on each carton/pallet of Continuous Filament Polyamide (Nylon 6) Yarn:

a) “For BIS certification details please visit www.bis.gov.in”

4. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1
(ONLY FOR GUIDANCE PURPOSE)

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or)S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
4.1	Identification	4.1	IS 7867/IS 667	S	06 Bobbins	Each month	In addition, each consignment of raw material shall be accompanied by test certificate of supplier
5.1 & Table 2/3/4	Cross Section	5.1	IS 7867	R	06 bobbins	After each scheduled Spinneret change	Samples of each type and variety to be drawn and tested.
-do-	Linear density	--	IS 7703(Part 1)	R	06 Bobbins	Each Control Unit	Samples of each type and variety to be drawn and tested.
-do-	No. of Filaments	Visual under microscope	IS 7867	R	06 Bobbins	After each scheduled Spinneret change	-do-
-do-	Tenacity and Elongation at Break	--	IS 7703 Part 2	R	06 Bobbins	Each Control Unit	-do-

-do-	Boiling water Shrinkage	Annex G	IS 17261	R	06 Bobbins	Each Control Unit	-do-
-do-	Interlace in nips per meter	Annex B	IS 17262	R	06 Bobbins	Each Control Unit	-do-
-do-	Spin finish oil pick up	Annex C	IS 17261	R	06 Bobbins	Each Control Unit	-do-
-do-	Unevenness of linear density	--	IS 7703(Part 5)	R	06 Bobbins	Each Control Unit	-do-
-do-	Lustre, titanium dioxide content	Annex F	IS 17261	S	06 Bobbins	Once in a month	-do-
-do-	Moisture regain	Annex B	IS 17261	R	06 Bobbins	Each Control Unit	-do-
-do-	Water soluble matter	--	IS 3456	R	06 Bobbins	Each Control Unit	-do-
-do-	Limiting oxygen Index (for fire retardant yarns only)	--	IS 13501	R	06 Bobbins	Each Control Unit	-do-
-do-	Ultraviolet resistance, UV-B lamp, 144 h (for UV resistant yarn only)	Annex F	IS 16481	S	06 Bobbins	Once in a month	-do-

-do-	Anti-microbial activity value, (for anti-microbial yarn only)	--	IS/ISO 20743	S	06 Bobbins	Once in a month	-do-
-do-	Colour strength with reference to standard yarn, percent (for dope dyed yarns only)	Annex E	IS 17261	R	06 Bobbins	Each Control Unit	Sample of each type and variety to be drawn and tested. Either of this test or Colour difference with reference to standard yarn, measured as ΔE , Max test needs to be complied with
-do-	Colour difference with reference to standard yarn, measured as ΔE , (for dope dyed yarns only)	Annex E	IS 17261	R	06 Bobbins	Each Control Unit	Sample of each type and variety to be drawn and tested. Either of this test or Colour strength with reference to standard yarn test needs to be complied with
-do-	Colour fastness to light (for dope dyed yarns only)	--	IS/ISO 105-B01 or IS/ISO 105-B02	S	06 Bobbins	Once in a year	-do-
5.2	Freedom from yarn defects,	CI 5.2	IS 7867	R	All Bobbins	Each Control Unit	-do-
5.3	Commercial Mass,	CI 5.3	IS 7867	R	--	Each Consignment of material	