



**PRODUCT MANUAL FOR
STEEL WIRE ROPES FOR AERIAL ROPEWAYS
PART 1 HAULING AND CARRYING HAULING ROPE
ACCORDING TO IS 10891 (Part 1):2025**

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence 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 license/certificate.

1.	Product	:	IS 10891 (Part 1):2025
	Title	:	Steel Wire Ropes for Aerial Ropeways- Part 1- Hauling and Carrying Hauling Rope
	No. of Amendments	:	Nil
2.	Sampling Guidelines:		
a)	Raw material	:	--
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	Mechanical Tests: 4 meter Chemical Tests: 5 pieces of 5cm x 5cm
3.	List of Test Equipment	:	Please refer ANNEX – B
4.	Scheme of Inspection and Testing	:	Please refer ANNEX –C
5.	Possible tests in a day :		Rope diameter (Cl. 4), General requirements (Cl. 6), Waviness (Cl. 8), Tests on wire prior to rope manufacture (Cl. 10.1 of IS 6594)
6.	Scope of the Licence :		Please refer ANNEX –D

ANNEX--A

GROUPING GUIDELINES

1. IS 10891(Part 1): 2025 covers “Steel Wire Ropes for Aerial Ropeways- Hauling and Carrying Hauling Rope” which are classified into different varieties based on the following:

- a) Construction- as per Table 1 to 7

or any other construction such as special developed ropes, as per agreement between manufacturer and purchaser as per Cl. 1 of IS 10891-1

- b) Rope Grade –1420/1570/ 1770/1960

- c) Core – Fibre/ Solid polymer/ Non-magnetic metallic covered with solid Polymer/ Steel covered with solid polymer/ Steel, as independent wire rope (CWR) or wire strand (WSC)

- d) Size (Nominal Diameter)

In addition to the size ranges given in Table 1 to 7 of IS 10891-1, other sizes of ropes may also be manufactured as agreed between manufacturer and purchaser as per Cl. 1 and Cl. 4 of IS 10891-1

- e) **Galvanized class B/Galvanized class AB/Ungalvanized**

2. Considering the above, the following grouping guidelines shall be followed for GoL/CSoL:

- i) Sample of each Construction shall be drawn and tested for all the requirements.
- ii) Separate samples of Wire Rope of each rope grade shall be tested for all the requirements.
- iii) Sample of highest size (nominal diameter) from the offered size range shall be drawn to cover all sizes below the tested size.
- iv) Separate samples of Wire Rope with each core type (Fibre/ Solid polymer/ Non-magnetic metallic covered with solid Polymer/ Steel covered with solid polymer/ Steel, as independent wire rope (CWR) or wire strand (WSC)), shall be drawn and tested for all requirements.
- v) The highest galvanization class (having most stringent requirements) steel wire rope shall be tested to cover ungalvanized and lower galvanization class steel wire ropes.

3. The Firm shall declare the Varieties of various Steel Wire Ropes for Aerial Ropeways they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

4. During the operation of license, it shall be ensured that all varieties covered in the license are tested in rotation, to the extent possible.

ANNEX--B**List of Test Equipment***Major test equipment required to test as per the Indian Standard*

Sr No	Tests used in with clause reference	Test equipment
1	Rope size and tolerance, Cl. 4, Table 1 to Table 7	Vernier caliper, Micrometer
1	Minimum breaking force - Cl. 5, 6, Table 1 to 7 Tensile test- Cl. 10.3.2 of IS 6594	Tensile testing machine / Breaking Load Testing Machine
2	Torsion test - Cl. 6 (Cl. 10.3.3 of IS 6594, 12.3 of IS 1835)	Torsion testing machine
3	Measurement of mass - Table 1 to 7	Weighing balance
4	Reverse Bend Test (Cl. 12.4 of IS 1835, 10.3.4 of IS 6594)	Bend testing machine
6	Length of rope - Cl. 6	Measuring tape / Length Counter meter
7	Shape and dimensions	Snap gauge / Profile projector
8	Waviness	Straight edge, Feeler gauge
9	Tests for Galvanizing (Cl. 11 , 12.6 of IS 1835)	Weighing balance, Chemicals, mandrels of suitable size etc.
10	Wrapping test (Cl. 12.5 of IS 1835)	Suitable fixture

The above list is indicative only and may not be treated as exhaustive.

ANNEX C**Scheme of Inspection and Testing****1. QUALITY ASSURANCE PLAN**

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) 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 (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of Control Unit is the quantity of the steel wire ropes of the same nominal diameter, Core, Construction and Grade manufactured under identical condition of production in a day.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

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.

2. ENSURING COMPLIANCE THROUGH TESTING- Manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

- i) Shared testing resources like common facility,
- ii) Cluster based testing facility,
- iii) Sub-contracting to outside laboratories which may either be:
 - a) BIS recognised/empanelled laboratories, or
 - b) Any accredited laboratory as per ISO/IEC 17025

2.1 TEST RECORDS- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted

at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. LABELLING AND MARKING - Labelling and Marking shall be done as per IS 10891 (Part 1): 2025. The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on a metal tag attached to each reel or drum on which ropes are coiled, always that the material so marked conforms to each requirement of the specification.

3.1 Additional Marking requirements: Additionally, the following shall also be marked on tag or package :

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

4. REJECTION - 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 (Recommended levels of control- For guidance only)

(1)				(2)		
Test Details				Levels of Control		
Clause	Requirement	Test Methods		No. of Sample	Frequency	Remarks
		Clause	Reference			
4	Size and Tolerance	4 Annex A	IS 10891 (Part 1) IS 6594	Manufacturer shall exercise adequate levels of control to ensure that entire production should conform to the Standard. Appropriate records of testing indicating conformity shall be maintained		
5	Minimum Breaking Force	5, Table 1 to 6 Annex B	IS 10891 (Part 1) IS 6594	One	Each Control Unit	
6	General Requirements					
-	Material	4.1	IS 6594	One	Each heat	No testing is required if the material is ISI Marked or accompanied with a test certificate.
-	Length	6.4	IS 6594	Each length	-	-

-	Approximate Mass	Table 1 to Table 6 6.5	IS 10891 (Part 1) IS 6594	Manufacturer shall exercise adequate levels of control to ensure that entire production should conform to the Standard. Appropriate records of testing indicating conformity shall be maintained		
-	Lay of rope	6.3 6.7	IS 10891-1 IS 6594			
-	Joints	6.2 6.8	IS 10891 (Part 1) IS 6594			
-	Freedom from defects	7	IS 6594			
-	Performing and Pre-stretching	6.4 8	IS 10891 (Part 1) IS 6594			
8	Waviness	Annex A	IS 10891-1			
-	Lubrication	9	IS 6594			
	Tests on wire prior to Rope Manufacture as per Cl. 10.1 of IS 6594					
-	a) Diameter	10.1	IS 1835	One	Each coil from which a specific construction and size is made	For individual wires one sample from one end of each coil wound round the bobbins for each size shall be tested for all the tests laid down. If a sample fails in any of the requirements, the particular coil shall be rejected
-	b) Tensile strength	12.2	IS 1835	One		
-	c) Torsion test	12.3	IS 1835	One		

-	d) Reverse bend test	12.4	IS 1835	One	Each coil from which a specific construction and size is made	
-	e) Wrapping test*	12.5	IS 1835	One		
-	f) Galvanizing test	11, 12.6	IS 1835	One		
	Tests on individual Wires*	10.3	IS 6594			
-	a) Tensile strength	10.3.2	IS 6594	As per Cl. 10.3.1.1 & 10.3.1.2 of IS 6594 (as applicable)	Each coil from which a specific construction and size is made	
-	b) Torsion test	10.3.3	IS 6594			
-	c) Reverse bend test	10.3.4	IS 6594			
-	d) Galvanizing test	10.3.5	IS 6594	One		
-	e) Diameter of wire	10.3.6	IS 6594	One		

*To be done only when specified by purchaser

ANNEX D

Scope of Licence

“Licence is granted to use Standard Mark as per IS 10891 (Part 1):2025 with the following scope:

Name of the product	Steel Wire Ropes for Aerial Ropeways- Part 1- Hauling and Carrying Hauling Rope
Size	
Construction	
Core	
Rope Grade	
Whether Galvanized or Ungalvanized If galvanized, class of galvanizing (B/AB)	