



**PRODUCT MANUAL FOR  
STEEL WIRE ROPES FOR AERIAL ROPEWAYS  
PART 1 HAULAGE ROPES  
ACCORDING TO IS 10891 (Part 1):2001**

*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.	<b>Product</b>	:	IS 10891 (Part 1):2001
	<b>Title</b>	:	Steel Wire Ropes for Aerial Ropeways- Part 1- Haulage Ropes
	<b>No. of Amendments</b>	:	Nil
2.	<b>Sampling Guidelines:</b>		
a)	<b>Raw material</b>	:	Fibre core - IS 1804
b)	<b>Grouping guidelines</b>	:	Please refer ANNEX – A
c)	<b>Sample Size</b>	:	Mechanical Tests: 4 meter Chemical Tests: 5 pieces of 5cm x 5cm
3.	<b>List of Test Equipment</b>	:	Please refer ANNEX – B
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer ANNEX –C
5.	<b>Possible tests in a day :</b>		Size and Tolerance (Cl. 7) General requirements (Cl. 6) Tests on wire prior to rope manufacture (Cl. 10.1 of IS 6594)
6.	<b>Scope of the Licence :</b>		Please refer ANNEX –D

**ANNEX--A**

**GROUPING GUIDELINES**

1. IS 10891(Part 1): 2001 covers Steel Wire Ropes for Aerial Ropeways- Haulage Ropes which are classified into different varieties based on the following:

- a) Construction (as per Cl. 1)
- b) Rope Grade –1420/1570/ 1770
- c) Core – Fibre/ Steel
- d) Size (Nominal Diameter)
- e) Galvanized/ Ungalvanized
  - Fibre core shall be of natural hard fibre.
  - The steel core shall be independent wire rope core (CWR).

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

- i) Separate samples of Steel Wire Rope with Fibre Core and Steel Core of any Construction and Size (Nominal Diameter), preferably the largest size, shall be drawn and tested for all the requirements.
- ii) However, the following relaxation may be given when a particular variety is tested for all the requirements:

<b>Variety Tested</b>	<b>Additional Variety that may be covered</b>
Rope Grade – 1770	Rope Grade – 1570 and 1420
Rope Grade - 1570	Rope Grade - 1420
Galvanized Steel Wire Rope	Ungalvanized Steel Wire Rope

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*

<b>Sr No</b>	<b>Tests used in with clause reference</b>	<b>Test equipment</b>
1	Rope size and tolerance, Cl. 4, Table 1	Vernier caliper, Micrometer
1	Minimum breaking force - Cl. 5, 6, Table 1 to 6 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 13	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	Tests for Galvanizing (Cl. 11 , 12.6 of IS 1835)	Weighing balance, Chemicals, mandrels of suitable size etc.
9	Wrapping test (Cl. 12.5 of IS 1835)	Suitable fixture
10	Tests for fibre core, Cl. 6.1.1	Weighing balance, Xylene/benzole, Methylene chloride, Extraction sleeve, Drying cabinet, dessicator, Soxhlet apparatus, chemicals and glassware as required

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

**ANNEX C**

**Scheme of Inspection and Testing**

**1. LABORATORY** - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

**1.1** The manufacturer shall prepare a calibration plan for the test equipment.

**2. TEST RECORDS** – The manufacturer shall maintain test records for the tests carried out to establish conformity.

**3. LABELLING AND MARKING** – As per Clause 10 of IS 10891 (Part 1): 2001.

**4. CONTROL UNIT** – All the steel wire ropes of the same nominal diameter, construction and grade manufactured under identical condition of production shall constitute a control unit.

**5. LEVELS OF CONTROL** - The tests as indicated in column 1 of [Table 1](#) and the levels of control in column 3 of [Table 1](#), shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

**6. REJECTIONS** – 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**

(1)				(2)	(3)		
Test Details					Levels of Control		
Clause	Requirement	Test Methods		Test equipment requirement Required (R) or Sub-contracting permitted (S)	No. of Sample	Frequency	Remarks
		Clause	Reference				
4	Size and Tolerance	4 Annex A	IS 10891 (Part 1) IS 6594	R	Each Rope	--	-
5	Minimum Breaking Force	5, Table 1 to 6 Annex B	IS 10891 (Part 1) IS 6594	R	One	Each Control Unit	
<b>6</b>	<b>General Requirements</b>						
-	Material	4.1	IS 6594	S	One	Each heat	No testing is required if the material is ISI Marked or accompanied with a test certificate.
-	Length	6.4	IS 6594	R	Each length	-	-
-	Approximate Mass	Table 1 to Table 6 6.5	IS 10891 (Part 1) IS 6594	R	Each length	-	-
-	Lay of rope	6.7	IS 6594	R	Each rope	-	-

-	Joints	6.2 6.8	IS 10891 (Part 1) IS 6594	R	Each rope	-	-
-	Freedom from defects	7	IS 6594	R	Each rope	-	-
-	Performing	6.4 8	IS 10891 (Part 1) IS 6594	R	One	Every loading length subject to a max. of 5 T	-
-	Lubrication	9	IS 6594	R	Each rope	-	-
-	<b>Tests on wire prior to Rope Manufacture</b>	<b>10.1</b>	<b>IS 6594</b>	-			
-	a) Diameter	10.1	IS 1835	R	One	Each coil from which a 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	R	One		
-	c) Torsion test	12.3	IS 1835	R	One		
-	d) Reverse bend test	12.4	IS 1835	R	One		
-	e) Wrapping test*	12.5	IS 1835	R	One		
-	f) Galvanizing test	11, 12.6	IS 1835	R	One		

	Tests on individual Wires*	10.3	IS 6594					
-	a) Tensile strength	10.3.2	IS 6594	R	As per Cl. 10.3.1.1 & 10.3.1.2 of IS 6594 (as applicable)	Each coil from which a construction and size is made		
-	b) Torsion test	10.3.3	IS 6594	R				
-	c) Reverse bend test	10.3.4	IS 6594	R				
-	d) Galvanizing test	10.3.5	IS 6594	R				One
-	e) Diameter of wire	10.3.6	IS 6594	R				One
<b>6.1</b>	<b>Core</b>	<b>6.1</b>	<b>IS 10891 (Part 1)</b>					
6.1.1	Fibre Core	All requirements of IS 1804, as applicable		S	Two	One batch of fibre core received	No testing is required if the material is ISI Marked or accompanied with a test certificate.	
6.1..2	Steel Core	6.1.2	IS 10891 (Part 1)	R	Each rope			

\* To be done only when specified by purchaser.

**Note-1:** Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

**Note-2:** Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

**ANNEX D**

**Scope of Licence**

“Licence is granted to use Standard Mark as per IS 10891 (Part 1):2001 with the following scope:

Name of the product	Steel Wire Ropes for Aerial Ropeways- Part 1- Haulage Ropes
Size	
Construction	
Core	
Rope Grade	
Whether Galvanized or Ungalvanized	