



PRODUCT MANUAL FOR STEEL WIRE ROPES FOR HAULAGE PURPOSES ACCORDING TO IS 1856:2021

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 1856:2021
	Title	:	Steel Wire Ropes for Haulage Purposes
	No. of Amendments	:	Nil
2.	Sampling Guidelines:		
a)	Raw material	:	Wire – as per Cl. 6 of IS 1856: 2021 read in conjunction with Cl. 4 of IS 6594 Core- as per Cl. 6.1 of IS 1856: 2021
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 Size and Tolerance (Cl. 4) General requirements (Cl. 6) 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 1856: 2021 covers Steel Wire Ropes for Haulage Purposes which are classified into different varieties based on the following:
 - a) Construction (as per Cl. 1)
 - b) Type – Round/ Flattened (Triangular) strand
 - c) Rope Grade – 1570/ 1770/ 1960
 - d) Core – Fibre/ Steel
 - Fibre Core shall be of Soft Fibre (Jute).
 - Steel Core shall be of Independent Wire rope Core (CWR). However, Core Wire Strand (CWS) may also be used for rope diameter 12 mm and below for 6 x 7 Construction (Table 1 of IS 1856) only.
 - e) Size (Nominal Diameter)
 - f) Galvanized/ Ungalvanized
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 Type, 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:

Variety Tested	Additional Variety that may be covered
Rope Grade – 1960	Rope Grade – 1770 and 1570
Rope Grade - 1770	Rope Grade - 1570
Steel Core - Independent Wire Rope Core (CWR)	Steel Core - Core Wire Strand (CWS), as applicable for 12 mm and below size for 6 X 7 construction (Table 1 of IS 1856) only
Galvanized Steel Wire Rope	Ungalvanized Steel Wire Rope

3. The Firm shall declare the Varieties of various Steel Wire Ropes 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 4	Vernier caliper, Micrometer
2.	Minimum breaking force - Cl. 5, Table 1 to 7 Tensile test- Cl. 10 of IS 6594	Tensile testing machine / Breaking Load Testing Machine
3.	Torsion test , Cl. 6 (Cl. 10.3.2 of IS 6594, 12.3 of IS 1835)	Torsion testing machine
4.	Approximate mass , Cl. 6.4- Table 1 to 4	Weighing balance
5.	Reverse Bend Test, Cl.6 (Cl. 12.4 of IS 1835, 10.3.4 of IS 6594)	Bend testing machine
6.	Length of rope - Cl. 6 (Cl. 6.4 of IS 6594)	Measuring tape / Length Counter meter
7.	Tests for Galvanizing, Cl.6 (Cl. 11 , 12.6 of IS 1835)	Weighing balance, Chemicals, mandrels of suitable size etc.
8.	Tests for fibre core, Cl. 6.2.1	Weighing balance, Xylene/benzole, Methylene chloride, Extraction sleeve, Drying cabinet, dessicator, Soxhlet apparatus, chemicals etc 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 requirements of IS 1856: 2021.

4. CONTROL UNIT – All the wire ropes of the same nominal diameter, construction, type and grade manufactured under identical conditions 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.

5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

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 1856 IS 6594	R	Each Rope	--	-
5	Minimum Breaking Force	5, Table 1 to 4 Annex B	IS 1856 IS 6594	R	One	Each Control Unit	
6	General Requirements						
	Requirements as per IS 6594						
-	Material	4.1	IS 6594	S	One	Each heat	Wire as per IS 1835 shall be ISI Marked.
-	Length	6.4	IS 6594	R	Each length	-	-
-	Freedom from defects	7	IS 6594	R	Each rope	-	-
-	Lubrication	9	IS 6594	R	Each rope	-	-

* To be done only when specified by purchaser.

-	Tests on wire prior to Rope Manufacture	10.1	IS 6594	-			
-	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 procedure as per Cl. 13 of IS 1835 shall be adopted.
-	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	7 11, 12.6	IS 1856 IS 1835	R	Two	One from each end of every 5 th coil or part thereof	
	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	In case of failure, procedure as per Cl. 11 of IS 6594 shall be adopted.
-	b) Torsion test	10.3.3	IS 6594	R		Each coil	
-	c) Reverse bend test	10.3.4	IS 6594	R		Each coil	

-	d) Galvanizing test	7 10.3.5	IS 1856 IS 6594 IS 6745	R	Two	One from each end of every 5 th coil or part thereof	In case of failure, procedure as per Cl. 11 of IS 6594 shall be adopted.
-	e) Diameter of wire	10.3.6	IS 6594	R	One		
6.1	Core	6.1	IS 1856				
6.1.1	Fibre Core	All applicable requirements of IS 1804		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	All requirements as per IS 6594 as outlined in this SIT					
6.2	Joints	6.2	IS 1856	R	Each rope	-	-
6.4	Approximate Mass	Table 1 to Table 4	IS 1856	R	Each length	-	-
6.3	Lay of rope	6.3	IS 1856	R	Each rope	-	-
6.5	Performing	8	IS 6594	R	One	Every loading length subject to a max. of 5 T	-

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 1856:2021 with the following scope:

Name of the product	Steel Wire Ropes for Haulage Purposes
Size	
Construction	
Type	
Core	
Rope Grade	
Whether Galvanized or Ungalvanized	