



PRODUCT MANUAL FOR WIRE ROPES AND STRANDS FOR GENERAL STRUCTURAL APPLICATIONS INCLUDING CABLE SUPPORTED BRIDGES ACCORDING TO IS 9282:2024

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 9282:2024
	Title	:	Wire Ropes and Strands for General Structural applications including Cable Supported Bridges
	No. of Amendments	:	Nil
2.	Sampling Guidelines:		
a)	Raw material	:	As per Cl.4 of IS 9282: 2002
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	Mechanical Tests: 4 meter Chemical Tests: 1 piece of wire of about 50 gms weight
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:		Requirements of wire (Cl. 4.2, 4.3, 4.4, 4.5), General requirements (Cl. 5), Joints (Cl. 6), Direction of Lay (Cl. 7), Length of lay (Cl. 8), Lubrication (Cl. 9)
6.	Scope of the Licence:		Please refer ANNEX –D

ANNEX -A

GROUPING GUIDELINES

1. IS 9282: 2024 covers “Wire Ropes and Strands for General Structural applications including Cable Supported Bridges” which are classified into different varieties based on the following:
 - a) Type- Round Strand/Spiral Strand/Full locked Coil Wire Rope
 - b) Construction (as per Cl. 1)
 - c) Rope Grade –1370/1420/1470/1570/1770
or any other Rope grade subject to agreement between purchaser and manufacturer as per Cl. 1 of IS 9282
 - d) Size (Nominal Diameter)
In addition to the size ranges given in Table 1 to 11 of IS 9282, other sizes of ropes may also be manufactured as agreed between manufacturer and purchaser as per Cl.1 of IS 9282
2. Considering the above, the following grouping guidelines shall be followed for GoL/CSoL:
 - i) Separate samples of Wire Rope of each type shall be tested for all the requirements.
 - ii) Separate samples of Wire Rope of each Construction shall be tested for all the requirements.
 - iii) Separate samples of Wire Rope of each rope grade shall be tested for all the requirements.
 - iv) Sample of highest size (nominal diameter) from the offered size range shall be drawn to cover all sizes below the tested size
3. The Firm shall declare the varieties 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***Indicative list of major test equipment required to test as per the Indian Standard*

Sr No	Tests used in with clause reference	Test equipment
1	Rope size, Cl. 1, Table 1 to 11 Dimensional limits and tolerances Cl. 4,	Vernier caliper, Micrometer
2	Minimum breaking force, Cl. 1, 10, Table 1 to 11 Tensile test, Cl. 4.2 Elongation test, Cl. 4.3 Proof stress test, Cl. 4.4	Tensile testing machine / Breaking Load Testing Machine
3	Measurement of mass - Table 1 to 11	Weighing balance
4	Length of rope - Cl. 6 of IS 6594	Measuring tape / Length Counter meter
5	Shape and dimensions	Snap gauge / Profile projector
6	Tests for Galvanizing, Cl. 4.5.1 (Cl. 11 of IS 1835)	Weighing balance, Chemicals
7	Wrap test, Cl. 4.5.2	Suitable fixture and mandrels.

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 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. Batch 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 below.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

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

1.3.2 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 sub-contracted 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. LABELLING AND MARKING – As per the requirement of IS 9282:2024. The Standard Mark, as given in the Schedule of the licence, shall be marked on a metal tag attached to each reel or drum on which ropes are coiled, provided always that the product thus marked conforms to all the requirement of the specification. In addition, the licence no. CM/L-_____ and details of BIS website shall be marked at an appropriate place on product or package as follows: “For details of BIS certification please visit www.bis.gov.in”.

4. REJECTION - All the production which conforms to the Indian Standard and covered under scope of the licence shall be marked with 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)

(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	Material	4.1	IS 9282 IS 1835	S	One	Each heat	No further testing is required if accompanied with test certificate or is ISI Marked
1, 4	Size and Tolerance	1, 4.2.1	IS 9282 IS 1835	R	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		
4	Tests on individual wires before manufacturing rope						
4.2.2	Tensile test	4.2.2	IS 9282 IS 1608 IS 6594	R	One	Each Reel	-
4.3	Elongation	4.3	IS 9282	R	One	Each Reel	-
4.4	Proof stress	4.4	IS 9282	R	One	Each Reel	-
4.5.1	Galvanizing	4.5.1	IS 9282 IS 1835	R	One	Each Reel	-

4.5.2	Wrap test	4.5.2	IS 9282	R	One	Each Reel	-
4	Tests on wires from completed ropes						
4.2.2	Tensile test	4.2.2	IS 9282 IS 1608 IS 6594	R	One	Each Reel/ Coil	-
4.3	Elongation	4.3	IS 9282	R	One		-
4.4	Proof stress	4.4	IS 9282	R	One		-
4.5.1	Galvanizing	4.5.1	IS 9282 IS 1835	R	One		-
4.5.2	Wrap test	4.5.2	IS 9282	R	One		-
5	General Requirements						
-	Length	6.4	IS 6594	R	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		
-	Approximate Mass	Table 1 to Table 11 6.5	IS 9282 IS 6594	R			
7	Lay of rope	7.1 to 7.3	IS 9282	R			
6	Joints	6.1, 6.2	IS 9282	R			
8	Length of lay	8	IS 9282	R			
9	Lubrication	9	IS 9282	R			

10	Minimum breaking force	10, Table 1 to Table 11	IS 9282	R	One	Every loading length subject to max 5 t	For each construction and size
					Two	Above 5 t	

ANNEX D**Scope of Licence**

“Licence is granted to use Standard Mark as per IS 9282:2024 with the following scope:

Name of the product	Wire Ropes and Strands for General Structural applications including Cable Supported Bridges
Type	
Construction	
Rope Grade	
Sizes	up to and including...mm