



**PRODUCT MANUAL FOR
MILD STEEL AND MEDIUM TENSILE STEEL BARS AND
HARD-DRAWN STEEL WIRE FOR CONCRETE REINFORCEMENT -
MILD STEEL AND MEDIUM TENSILE STEEL BARS
ACCORDING TO IS 432 (PART 1): 1982**

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 licence/certificate.

1.	Product	:	IS 432 (Part 1) : 1982
	Title	:	Mild Steel and Medium Tensile Steel Bars and Hard-Drawn Steel Wire for Concrete Reinforcement - Mild Steel and Medium Tensile Steel Bars
	No. of Amendments	:	2
2.	Sampling Guidelines:		
a)	Raw material	:	Mild Steel & Medium Tensile Steel - Clause 4 of IS 432 (Part 1)
b)	Grouping guidelines	:	Please refer Annex-A
c)	Sample Size	:	For Mechanical Test – 1 m For Chemical Test – 5 cm x 5 pieces
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: All tests		
6.	Scope of the Licence :		Please refer Annex - D

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ANNEX A**GROUPING GUIDELINES**

1. Mild Steel and Medium Tensile Steel bars as per IS 432 (Pt 1) are categorized as given below:

- **Mild Steel Bars**

- (i) Grades - Grade I and II
- (ii) Nominal Size (mm) - 5, 6, 8, 10, 12, 16, 20, 22, 25, 28.32, 36, 40,45 and 50

- **Medium Tensile Steel Bars**

- (i) Nominal Size (mm) - 5, 6, 8, 10, 12, 16, 20, 22, 25, 28.32, 36, 40,45 and 50

2. Further, Mild Steel and Medium Tensile Steel bars are grouped as under based on nominal size:

	Nominal Sizes		
	Group I	Group II	Group III
Mild Steel Bars (Grade I/ Grade II)	Upto and including 20 mm	Over 20 mm, Upto and including 50 mm	--
Medium Tensile Steel Bars	Upto and including 16 mm	Over 16 mm, Upto and including 32 mm	Over 32 mm, Upto and including 50 mm

3. Considering the above, the guidelines given below shall be followed for GoL/CSoL:

(a) For Mild Steel Bars, sample of any size from each group for each Grade shall be tested for all requirements to cover the complete range of sizes in that group for that particular grade tested.

(b) For Medium Tensile Steel Bars, sample of any size from each group shall be tested for all requirements to cover the complete range of sizes in that group.

4. The Firm shall declare the varieties of Mild Steel and Medium Tensile Steel bars they intend to cover in the Licence. The Scope of Licence may be restricted based on the manufacturing and testing capabilities of the manufacturer.

5. During the operation of the Licence, BO shall ensure that all the types and sizes covered in the Licence 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*

Sl No	Test used in with clause reference	Test equipment
1	Chemical tests (Cl 4)	<ul style="list-style-type: none"> - Spectrophotometer <li style="text-align: center;">OR - Carbon Sulphur (Strohlein's type) Apparatus – Complete set consisting of glass parts, combustion furnace, oxygen cylinder, combustion tubes/ boats etc. a) Electronic Balance b) Hot plate c) Muffle furnace d) Barometer e) Thermometer f) Distilled water plant g) Burette, Pipette and Full Range of Laboratory Glassware - Conical Flasks, Beakers, Funnel, Pipettes Glass rod, watch Glass, Brush etc. h) Standard Reference Material i) Platinum/Silica Crucible for Silicon Test j) Desiccators k) Watt Man Filter Paper & Ash less clippings l) Drilling machine <p>- Chemicals and reagents as applicable</p>
2	Nominal Size (Cl 5.1, 6.1)	<ul style="list-style-type: none"> - Ball Ended Micrometer - Vernier Caliper (for higher sizes)
3	Cutting tolerances on length (Cl 7.1)	<ul style="list-style-type: none"> - Measuring Tape
4	Mass (Cl 6.2)	<ul style="list-style-type: none"> - Weighing Balance
5	(i) Ultimate Tensile Stress (ii) Yield Stress (iii) Total Elongation % (Cl 8.1)	<ul style="list-style-type: none"> - Tensile Testing Machine - Extensometer with Dial Gauge - Ball ended Micrometer - Steel Scale - Vernier Caliper

		<ul style="list-style-type: none">- Thermometer- Scriber- Hammer- Sample Cutter- Air Conditioner
6	Bend test (Cl 8.2)	<ul style="list-style-type: none">- Steel Mandrels- Templates- UTM or any other press machine

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.

The manufacturer shall prepare a calibration plan for the test equipments.

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

3. LABELLING AND MARKING – As per the requirements of IS 432 (Part 1): 1982.

4. CONTROL UNIT – Mild steel and medium tensile steel bars of each grade and size manufactured from same cast/lot of raw material in a day 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				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods Clause Reference			No. of Sample	Frequency	Remarks
4	Chemical requirements	4.1, 4.2, 4.3	IS 432 (Pt 1)	S	A test certificate indicating conformity of the material to the requirements of the specification shall be obtained for each cast/lot received.		
5	Freedom from Defects	5.1	IS 432 (Pt 1)	R	Adequate inspection to ensure that each bundle/ coil is free from surface defects		
6	Nominal size & Mass	6.1, 6.2	IS 432 (Pt 1)	R	Two	One sample shall be drawn from starting and ending of each coil/ bundle	*
7	Rolling & Cutting tolerances on dimensions	7.1	IS 432 (Pt 1)	R	Random check shall be carried out		---
8	Tensile Test (Ultimate Tensile Stress, Yield stress and Percentage elongation)	8.1 & 9.2	IS 432 (Pt 1)	R	One	Each control unit or 5 ton whichever is less	*
	Bend test	8.2 & 9.3	IS 432 (Pt 1)	R	One		*

* In case of failure, two samples from same control unit shall be tested for that requirement and control unit shall be accepted only if both samples pass.

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 432 (Part 1) : 1982 with the following scope:	
Name of the product	Mild Steel Bars/ Medium Tensile Steel Bars
Nominal Size, mm	Upto and including ----- mm
Grade (only for Mild Steel bars)	I/ II