



**PRODUCT MANUAL FOR
BAR/WIRE WRAPPED STEEL CYLINDER PIPES WITH MORTAR
LINING AND COATING (INCLUDING SPECIALS)
ACCORDING TO IS 15155: 2002**

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 15155 : 2002
	Title	:	BAR/WIRE WRAPPED STEEL CYLINDER PIPES WITH MORTAR LINING AND COATING (INCLUDING SPECIALS)
	No. of Amendments	:	NIL
2.	Sampling Guidelines:		
a)	Raw material	:	Please refer ANNEX – A
b)	Grouping guidelines	:	Please refer ANNEX – B
c)	Sample Size	:	All tests to be done in factory as the licence is operated on Factory Testing basis. Sample of mortar cubes (3 Nos) shall be drawn and tested for assessment of quality of mortar.
3.	List of Test Equipment	:	Please refer ANNEX – C
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – D
5.	Possible tests in a day :		
	All tests to be done in factory as the licence is operated on Factory Testing basis		
6.	Scope of the Licence : Please refer ANNEX -E		

ANNEX A

RAW MATERIAL

- 1) All types and sizes of steel used for longitudinal and spiral reinforcement shall be ISI marked conforming to the relevant Indian Standard as mentioned in IS 15155.
- 2) Spirals, Wire mesh or wire fabric for specials – IS 1566 and Clause 9.2 of IS 15155.
- 3) Steel for cylinders, joint rings and specials – Clause 4.6 and clause 9.1 (for Specials) of IS 15155 and IS 2062. Steel shall be ISI marked.
- 4) All types and sizes of coarse and fine aggregate – clause 4.2 of IS 15155 and IS 383
- 5) Cement used for the manufacture of concrete pipes - ISI marked conforming to the relevant Indian Standard as mentioned in IS 15155.
- 6) Water used for cement mortar preparation and curing of pipes – clause 4.3 of IS 15155 and clause 5.4 of IS 456.
- 7) Mortar used in manufacturing of pipes/specials - clause 8.2.1 of IS 15155. Strength of mortar shall be ensured by testing mortar cubes.
- 8) Rubber sealing ring – Clause 4.7 of IS 15155 and IS 5382
- 9) Admixtures (if used) – IS 9103.

Note: If different type and/or sizes of steel for reinforcement are used, it shall be treated as additional raw material. Similarly, if source and/or size and types of coarse and fine aggregate has changed, it shall be treated as additional raw material.

ANNEX - B**Grouping Guidelines**

1. Bar/Wire wrapped steel cylinder pipes with mortar lining and coating/Specials as per IS 15155:2002 are classified as given below:

- a) Sizes – 250 mm to 1600 mm
- b) Factory test pressure – to be declared by manufacturer
- c) Type of ends/joints – Steel socket and spigot ring (rubber ring joint)/Steel ring (welded joint)

(Pipes with internal diameter other than those specified in Table 1 of IS 15155: 2002 and pipes for working pressure higher than 28 kg/cm² may be supplied as per mutual agreement between the purchaser and the manufacturer)

2. Sizes of pipes / specials further classified into following groups based on minimum wall thickness:

	Group -I	Group -II	Group -III
Sizes	250 to 400 mm	500 to 1000 mm	1100 to 1600 mm

3. Considering the above, following grouping guidelines is developed for GoL/CSoL :
- a) Pipes/ Specials of each type shall be tested from each size group for each factory test pressure rating to cover all sizes of Pipes / Specials in that particular group.
 - b) If Pipe/Special with higher factory test pressure is tested, Pipe/Special with lower factory test pressure from the same group may also be covered.
 - c) For sizes not covered in Table 1 of IS 15155: 2002, each type of Pipe/Special for each minimum wall thickness shall be tested to to cover all sizes of the particular type of Pipe/Special for that minimum wall thickness.
4. 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.
5. During the operation of the Licence, BO shall ensure that all the varieties covered in the Licence are tested in rotation, to the extent possible.

ANNEX C
List of Test Equipment

Major test equipment required to test as per the Indian Standard

S. No.	Tests used in with Clause Reference	Test Equipment
1	Dimension and Tolerance Clause 5	<ul style="list-style-type: none"> - Steel Tape - Steel Scale - Vernier Calipers - Micrometer - Go & No-Go Calipers - Go-No Go gauges of stiff rod
2	Workmanship ad finish Clause 10	<ul style="list-style-type: none"> - Straight edge as per clause 10.1& 13.1.5 - Vernier caliper
3	Hydrostatic Test Clause 11.1 Pipe test at factory Clause 11.2	<ul style="list-style-type: none"> - Hydrostatic Test Arrangement fitted with water gauge or pressure gauge of suitable range and least count and water filling arrangement - Stop watch - Feeler gauge of 0.5 mm - Vernier caliper
4	Permeability Test on coating Clause 11.3	<ul style="list-style-type: none"> - Permeability Test Arrangement with graduated glass tubes, metal cups, wash bottles, crocks etc as per IS 3597
5	Compressive strength of cement mortar cube Clause 8.2.1	<ul style="list-style-type: none"> - Compressive Strength Test Machine fitted with Load Gauge suitable to test cement mortar - Moulds of size 7.09 x 7.09 x 7.09 cm
6	Size of aggregates Clause 4.2	<ul style="list-style-type: none"> - Sieve Set IS Sieve Designations : 4.75 mm, 2.36 mm, 1.18 mm. 600 micron, 300 micron 150 micron and 75 micron
7	Weighment of spiral and steel cylinder	<ul style="list-style-type: none"> - Weighing balance

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

ANNEX D

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 – Each pipe/ Special shall be marked with following:

- a) Manufacturer's name or Trademark
- b) Size of Pipe/Specials and Factory test pressure
- c) Date of manufacturing and control unit
- d) Colour band at ends (as per clause 12.2)

4. CONTROL UNIT – 50 Pipes / Specials of the same type or part thereof of same factory test pressure, size and coating, manufactured continuously on consecutive days under similar conditions of manufacturing and from same source of raw material 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 Standard 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				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
4	Material						
4.1	Cement	4.1	IS 15155	S	-	-	Cement received shall be ISI marked and accompanied with test certificate.
4.2	Aggregates	4.2	IS 15155 IS 383	S	One	Once in year for each size.	Additional sample shall be tested wherever there is change in source of raw material.
4.3	Water	4.3	IS 15155 IS 456	S	One	Once in a year or whenever there is a change in source of water, whichever is earlier	
4.4	Admixtures (if used)	4.4	IS 15155 IS 9103	S	One	Each consignment	No further testing is required if accompanied with test certificate or ISI marked.
4.5	Reinforcement	4.5	IS 15155	S	-	-	Reinforcement material received shall be ISI marked and accompanied with test certificate.
4.6	Steel for cylinders, joint rings and specials	4.6	IS 15155	S	-	-	Steel shall be ISI marked and accompanied with test certificate
4.7	Rubber sealing rings	4.7	IS 15155	S	One	Each size and source	No further testing is required, if received with test certificate or ISI marked.
4.8	Bitumen or other protective coating	4.8	IS 15155	-	-	-	Coating shall be declared by manufacturer and comply with requirements specified.
5	Dimensions and tolerances	5.1, 5.2 and 13.1	IS 15155	R	Each pipe	-	-
6	Joint dimensions	6 and 13.1	IS 15155	R	Each pipe	-	-

7	Design criteria	7.3 to 7.5	IS 15155	-	Each pipe	-	-
8	Manufacturing	8.1 to 8.4	IS 15155	-	Each pipe	-	-
8.2.1	Compression Test on mortar Cubes	8.2.1	IS 15155	R	One consisting of 3 cubes from each consignment of cement	Supply of cement executed against order spread over up to three months shall be taken as one consignment for this test only. One sample may be tested in a month in case same mix is used for different size/pressure rating of pipes.	
9	Specials						
9.1	Fabrication	9.1	IS 15155	R	Each special	-	-
9.2	Reinforcement	9.2	IS 15155	R	Each special	-	-
10	Workmanship and finish						
10.1	Deviation from straightness	10.1 13.1.5	IS 15155	R	Each pipe	-	-
10.2	Finish	10.2	IS 15155	R	Each pipe	-	-
11.1	Hydrostatic test for steel cylinder of pipe	11.1	IS 15155	R	Each cylinder	-	-
11.2	Pipe test at factory	11.2	IS 15155	R	One	Each control unit	If pipe fails, two more pipes from same control unit shall be tested and control unit may be accepted only if both retested pipes pass. If retested pipes fail, all pipes shall be tested and only those pipes which are conforming shall be marked.
11.3	Permeability test on coating	11.3	IS 15155	R	Three	Each control unit	If any pipe fails, all pipes shall be tested and only those pipes which are conforming shall be marked.

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- E**Scope of the Licence :**

“Licence is granted to use Standard Mark as per IS 15155 : 2002 with the following scope:	
Name of the product	i. BAR/WIRE WRAPPED STEEL CYLINDER PIPES WITH MORTAR LINING AND COATING ii. SPECIALS
Nominal internal diameter (mm)	
Working pressure (N/mm ²)	
Type of ends/joints	Steel socket and spigot ring (rubber ring joint)/Steel ring (welded joint)
Details of specials	Bends/Air valves/ Scour valve tees etc