



**PRODUCT MANUAL FOR  
ROTATIONAL MOULDED POLYETHYLENE  
WATER STORAGE TANKS  
ACCORDING TO IS 12701: 1996**

*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.	<b>Product</b>	:	IS 12701 : 1996
	<b>Title</b>	:	ROTATIONAL MOULDED POLYETHYLENE WATER STORAGE TANKS
	<b>No. of Amendments</b>	:	2
2.	<b>Sampling Guidelines:</b>		
a)	<b>Raw material</b>	:	Polyethylene resin and Carbon black – Clause 4 of IS 12701
b)	<b>Grouping guidelines</b>	:	Please refer <a href="#">ANNEX – A</a>
c)	<b>Sample Size</b>	:	1 tank for all tests
3.	<b>List of Test Equipment</b>	:	Please refer <a href="#">ANNEX – B</a>
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer <a href="#">ANNEX – C</a>
5.	<b>Possible tests in a day :</b>	:	Please refer <a href="#">ANNEX – D</a>
6.	<b>Scope of the Licence :</b>		
	“Licence is granted to use Standard Mark as per IS 12701 : 1996 with the following scope:		
	Name of the product	ROTATIONAL MOULDED POLYETHYLENE WATER STORAGE TANKS	
	Type	Cylindrical Vertical Tank / Rectangular Loft Tank	
	Number of layers	Single layer/Double layer	
	Net capacity	--- litres	

**ANNEX A****Grouping Guidelines**

1. Rotational Moulded Polyethylene Water Storage Tanks as per IS 12701 : 1996 are classified as given below:

<b><i>Number of Layers</i></b>	Single layer / Double layer
<b><i>Type</i></b>	Cylindrical Vertical Tank/ Rectangular Loft Tank
<b><i>Net Capacity</i></b>	Cylindrical Vertical Tank - 200 litres to 20000 litres Rectangular Loft Tank - 150 litres to 500 litres

2. For considering GoL/CSoL, Water Tanks are grouped as given below:

<b>Type of Tanks</b>	<b>Net Capacity (litres)</b>			
	<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>
Rectangular loft tanks	150 – 500	-	-	-
Cylindrical vertical tanks	200 – 500	700 -3000	4000 – 7500	10000 - 20000

3. Water Tank from each group, preferably with highest net capacity, from each type shall be tested for all requirements to cover water tanks of all capacities in that group for that particular type tested.
4. Separate sample shall be tested for single layer and double layer water tanks.
5. The Firm shall declare the varieties intended to be covered in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.
6. 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 B****List of Test Equipment***Major test equipment required to test as per the Indian Standard*

<b>Sl. No.</b>	<b>Tests used in with Clause Reference</b>	<b>Test Equipment</b>
1	Density of resin (Clause 4.2.1)	<ul style="list-style-type: none"> <li>- Digital Balance with holding attachment</li> <li>- Distilled water</li> <li>- Butyl Acetate</li> <li>- Hydrometer</li> <li>- Glass beaker of 250 ml capacity</li> <li>- Thermometer</li> <li>- Air conditioner (preferably)</li> </ul>
2	Melt flow rate (Clause 4.2.2)	<ul style="list-style-type: none"> <li>- Melt flow rate Apparatus with digital temperature controller and timer and load of 2.16 kg</li> </ul>
3	Carbon black content and carbon dispersion (Clause 4.2.3)	<ul style="list-style-type: none"> <li>- Furnace to accommodate the combustion tube with digital temperature controller</li> <li>- Combustion boats made of porcelain or silica, having minimum dimensions of 75 mm length, 9 mm width &amp; 8 mm height</li> <li>- Combustion tube made of hard glass of approximately 30 mm diameter and 400 ± 50 mm length</li> <li>- Nitrogen gas Cylinder with flow meter for controlling flow of nitrogen within 1.7 ± 0.3 litres per minute.</li> <li>- Analytical balance or equivalent, capable of weighing to the nearest 0.1 mg</li> <li>- Desiccator, Trichloroethylene &amp; solid carbon dioxide</li> <li>- Fume Hood</li> <li>- Hot plate</li> <li>- Projection Microscope with 100/200 times magnification</li> <li>- Glass Slides</li> </ul>
4	Dimensions, capacity and weight (Clause 5.1, 5.2) Wall thickness (Clause 5.4)	<ul style="list-style-type: none"> <li>- Flexible measuring tape / Steel tape</li> <li>- Steel scale</li> <li>- Vernier calliper</li> <li>- Dial gauge micrometre with spherical anvils/ ultrasound thickness gauge</li> <li>- Weighing balance with weights / platform digital balance</li> <li>- Volumetric capacity measurement in litre or flow meter with stop watch or water meter</li> </ul>

5	Resistance to deformation (Clause 7.1)	- Steel measuring tape / Flexible tape
6	Resistance to impact (Clause 7.2)	- Hemispherical ended striker of diameter 25 mm and weight 2.5 kg - Steel scale / Tape
7	Test for top load resistance (Clause 7.3)	- 100 kg load
8	Tensile strength (Clause 7.4)	- Tensile testing machine - Sample cutting die punch - Vernier calliper - Micrometre - Thermometer - Extensometer
9	Flexural modulus (Clause 7.5)	- Flexural strength testing machine with loading arrangement and supports - Dial indicator for deflection measurement - Vernier calliper - Micrometre
10	Overall migration (Clause 7.6)	- Electric oven / water bath / pressure cooker - Electric hot plate - Analytical balance - Glass beaker - Stainless steel evaporating dish - Stainless steel tongs
11	Man-hole Hand-hole lids (Clause 9)	- Steel wire 1.6 mm

*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 the requirements of IS 12701: 1996

**4. CONTROL UNIT** – 100 Water Tanks of same capacity/100 Lids or part thereof of the same type and construction (single layer or double layer), manufactured from the same batch of raw material on same machine under similar conditions of manufacture 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	Polyethylene resin	4.1 4.2	IS 12701  IS 10141	S	1	Each consignment	#
4.2.1	Density	4.2.1	IS 12701 IS 7328	R	1	Each consignment	-
4.2.2	Melt flow rate	4.2.2	IS 12701 IS 2530	R	1	Each consignment	-
4.2.3	Carbon black content and carbon dispersion	4.2.3	IS 12701 IS 2530	R	1	Each control unit or each lot of lids received	-
5	<b>Types and Features</b>						
	Overall diameter	5.1	IS 12701	R	1	20 tanks or part thereof from each control unit	-
	Overall length, Overall width	5.2	IS 12701	R	1		
	Overall height, Minimum internal diameter of man-hole / hand-hole	5.1 , 5.2,	IS 12701	R	1		
	Net and Gross capacity	5.1, 5.2	IS 12701	R	1	Each control unit	-
	Minimum wall thickness and bottom thickness	5.1, 5.2, 5.4, 5.6	IS 12701	R	1	Each control unit	-
	Minimum weight of tank (without lid)	5.1, 5.2	IS 12701	R	1	Each control unit	-

6	Finish	6	IS 12701	-	Each water tank	-	-
7.1	Resistance to deformation	7.1 Annex-B	IS 12701	R	2	Each control unit	In case both samples fail, control unit shall be rejected. If one sample fails, four more samples shall be tested and control unit shall be accepted if all the samples pass.
7.2	Resistance to impact	7.2 Annex-C	IS 12701	R	2	Each control unit	
7.3	Test for top load resistance	7.3.1	IS 12701	R	2	Each control unit	
7.4	Tensile strength	7.4	IS 12701	R	1	Each control unit	-
7.5	Flexural modulus	7.5	IS 12701	R	1	Each control unit	-
7.6	Overall migration	7.6	IS 12701	S	1	Once in three months	\$
9	Man-hole and hand-hole lids	9.1 9.2 9.2.1	IS 12701	R	1	Each control unit or each size received in a lot	-

# No further testing is required if accompanied with the Test Certificate.

\$ In case of failure marking shall be stopped and same shall be resumed only after taking necessary corrective actions.

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**

**POSSIBLE TESTS IN A DAY**

- 1) Density (Clause 4.2.1)
- 2) Melt Flow Rate (Clause 4.2.2, Clause 9.1)
- 3) Carbon Black Content and Carbon dispersion (Clause 4.2.3, Clause 9.1)
- 4) Dimensions, net and gross capacities, weight (Clause 5)
- 5) Finish (Clause 6)
- 6) Resistance to impact (Clause 7.2)
- 7) Top load resistance (Clause 7.3)
- 8) Flexural Modulus (Clause 7.5)
- 9) Lid fitment (Clause 9.2)