



PRODUCT MANUAL FOR LIQUID NITROGEN VESSELS OF CAPACITY UP TO 75 LITRES ACCORDING TO IS 11552:2008

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 11552:2008
	Title	:	Liquid Nitrogen Vessels of Capacity up to 75 litres
	No. of Amendments	:	2
2.	Sampling Guidelines:		
a)	Raw material	:	As per Cl. 3.1 of IS 11552: 2008
b)	Grouping guidelines	:	Each design of Vessel shall be tested for all requirements for considering GoL/ CSoL. Change of design of Vessel is defined at Clause 5.2 of IS 11552: 2008. Further, separate samples shall be tested for Refrigeration/ Storage Vessels and for Vessels for Transport Applications.
c)	Sample Size	:	--
3.	List of Test Equipment	:	Please refer ANNEX – A
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – B
5.	Possible tests in a day	:	As the Licence is granted and operated on factory testing basis, complete testing during PI shall be done in factory for 9 days. However, surveillance inspection shall be planned only for 4 days during which all tests except type tests (as per clause 4.3 of IS 11552:2008) shall be carried out.
6.	Scope of the Licence	:	Please refer ANNEX – C

ANNEX A**List of Test Equipment***Major test equipment required to test as per the Indian Standard*

Sl. No.	Tests used in with Clause Reference	Test Equipment
1.	Minimum Thickness, Cl 3.2.1	Vernier caliper, Micrometer
2.	Performance test, Cl. 4.2	Liquid Nitrogen, Pressure gauges, Thermocouples, Precise Weighing scale, Stopwatch
3.	Leak tightness test, Cl. 4.2.9	Helium Mass Spectrometer Leak Detector
4.	Vibration test, Cl. 10.4, 11.4	Vibration testing equipment consisting of Vibration table, accelerometer, signal conditioners, data display etc as per IS 7028(Part 2)
5.	Water capacity, Cl. 5.1	Weighing balance
6.	Vacuum level, Cl. 3.2.3, B- 3.1	Pressure/Vacuum gauge
7.	Hardness, Cl. 12.2.4	Shore hardness tester
8.	Leakage test, 12.2.3	Nitrogen/Air Source, Pressure gauge

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

ANNEX B

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 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 11552:2008.

3.1 Each liquid nitrogen vessel shall be accompanied with a bilingual guide/manual for use and safety instructions as per Cl 8 of IS 11552:2008.

4. CONTROL UNIT – Liquid nitrogen vessels of same size, design and type produced in a day from same consignment 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 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				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
3.1	Material of Construction	3.1.1 to 3.1.3	IS 11552	S	One	Each consignment	Raw material which are covered under mandatory certification of BIS shall be ISI marked and received along with manufacturer's test certificate. For all other materials no further testing is required if accompanied with test certificate or ISI Marked.
3.2	Construction						
3.2	General Construction Requirements	3.2.1 to 3.2.6, 3.2.8, 3.2.9	IS 11552	R	Each vessel	--	--
3.2.1	Min thickness of Inner Shell and Outer Shell	3.2.1	IS 11552	R	Three	Every hour	To be tested on the sheets before construction
3.2.3	Vacuum Level	3.2.3	IS 11552	R	Each vessel		To be tested during construction, before sealing of outlet port and removing of vessels from evacuation & heating assembly.
3.2.7	Welding	3.2.7	IS 11552	R	Each inner and outer shell		
4.2	Performance Test	4.2.1 to 4.2.8	IS 11552	R	As per Cl. 4.2.7 of IS 11552	IS	In case of failure, procedure as per Cl. 4.2.8 shall be followed. If any sample fails, the same shall be re-evacuated and heated and retested for performance test. If sample again fails, vessel shall be rejected and scrapped.
4.2.9	Leak Tightness Test	4.2.9	IS 11552	R	Each inner shell & each outer vessel before painting		If leakage is observed through welding it may be re-welded and tested. However, if it fails again, the vessel shall be rejected and scrapped. For any other leakage, vessel shall be rejected and scrapped.
5.1	Water Capacity	5.1.1 & 5.1.2	IS 11552	R	Five	Each control unit	---

10.1, 10.2	General construction	10.1, 10.2	IS 11552	R	Each vessel		
10.3, 10.4	Vibration Test and Performance Test after vibration test	10.3, 10.4, 10.4.1, 10.4.2	IS 11552	R	Three samples	Once in a year for each size and type manufactured during the period or whenever there is change in design.	If any of the three samples fails or whenever there is change in design as per clause 5.2 of IS 11552, ten samples from fresh lot shall be subjected to vibration test and performance test for conformity to the requirements of IS 11552. In case of failure, marking of particular design shall be stopped and process/design parameters shall be reviewed and revalidated till all ten samples pass from fresh lot.
11.1, 11.2, 11.5	General construction	11.1, 11.2, 11.5	IS 11552	R	Each vessel	--	--
11.3, 11.4	Vibration Test and Performance Test after vibration test	11.3, 11.4, 11.4.1, 11.4.2	IS 11552	R	Three samples	Once in a year for each size and type manufactured during the period or whenever there is change in design.	If any of the three samples fails or whenever there is change in design as per clause 5.2 of IS 11552, ten samples from fresh lot shall be subjected to vibration test and performance test for conformity to the requirements of IS 11552. In case of failure, marking of particular design shall be stopped and process/design parameters shall be reviewed and revalidated till all ten samples pass from fresh lot.
12	Accessories (if supplied)	12.1 to 12.4	IS 11552	R	--	--	Adequate inspection shall be carried out to ensure that the accessories are in accordance with the requirements laid down in the Standard.

Note-1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: The control unit and levels of control as decided by the Bureau are obligatory, to which the licensee shall comply with.

ANNEX C**Scope of Licence**

“Licence is granted to use Standard Mark as per IS 11552:2008 with the following scope:	
Name of the product	Liquid Nitrogen Vessel
Intended use	(a) Refrigeration/ Storage Applications (b) Transport Applications
Water Capacity (Litres)	
Design and	As per Cl. 5.2 of IS 11552: 2008
Drawing number	
Any other aspect required as per the Standard	Accessories provided, if any.