



उत्पाद मैनुअल
आई एस 7302: 2018 के अनुसार
स्वयं समाहित श्वसन तंत्र और स्वयं समाहित पानी के नीचे श्वसन तंत्र के लिए
वाल्व फिटिंग के लिए

दस्तावेज संख्या – पी एम/आई एस 7302/2/ अगस्त 2024

भारतीय मानक ब्यूरो की स्कीम-I (अनुरूपता मूल्यांकन) विनियम, 2018 के तहत यह उत्पाद मैनुअल प्रमाणीकरण के प्रचालन में रीति और पारिश्रिता की सुसंगतता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों और लाइसेंसी द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस प्रमाणीकरण लाइसेंस/ प्रमाणपत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज का उपयोग किया जा सकता है।

PRODUCT MANUAL FOR
VALVE FITTINGS FOR SELF CONTAINED BREATHING APPARATUS
(SCBA) AND SELF CONTAINED UNDERWATER BREATHING
APPARATUS (SCUBA)
ACCORDING to IS 7302:2018

Document No.- PM/IS 7302/2/August 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 licence/certificate.

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**PRODUCT MANUAL FOR
VALVE FITTINGS FOR SELF CONTAINED BREATHING
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1.	Product	:	IS 7302: 2018
	Title	:	Valve fittings for Self-Contained Breathing Apparatus (SCBA) and Self-Contained Underwater Breathing Apparatus (SCUBA)
	No. of Amendments	:	One
2.	Sampling Guidelines:		
a)	Raw material	:	As per Cl. 4 of IS 7302
b)	Grouping guidelines	:	Each Variety of valve shall be tested for GoL/CSoL
c)	Sample Size	:	(a) Assembled valves- 11 pieces (b) Samples for Tensile strength and elongation, Izod and Tensile (c) Valve body piece for chemical testing- 1 piece Licence is granted and operated on factory testing basis. 2 man days are required for complete testing
3.	List of Test Equipment	:	Please refer ANNEX – <u>A</u>
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – <u>B</u>
5.	Possible tests in a day: All Tests except Endurance test		
6.	Scope of the Licence	:	Please refer ANNEX – C

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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.	Tensile strength and % Elongation, Cl. 4.2.1	Tensile testing machine
2.	Izod impact test, Cl. 4.2.2	Izod Impact testing machine
3.	Valve dimensions and minimum thickness, Cl. 5.1, Cl. 5.2, Cl. 6, Cl. 7	Vernier Caliper, Micrometer, Thread Plug Gauges and Ring Gauges as per Cl. 6 and 7, Inside pistol caliper
4.	Valve Burst Test, Cl 8.6.1	Hydrostatic Testing Machine with pressure gauge
5.	Resistance to mechanical impact (Valve impact 8.6.2)	Valve Impact Test fixture with steel ball as per Cl. 8.6.2
6.	Valving Torque Test, Cl 8.6.3	Torque Wrench
7.	Excessive Torque Cl. 8.6.4	Torque Wrench & Holding Fixture
8.	Leak Tightness Test 8.7,	Test Bench with Pressure Gauge
9.	Endurance Test Cl 8.8	Endurance Testing Machine with counter
10.	Internal / External Cl 8.7 at - 20 degree	Deep Freezer
11.	Internal / External Cl 8.7 at + 65 degree (± 2.5 degree)	Hot air Oven
12.	Flame Impingement test Cl 8.10	LPG blowpipe, Thermometer/Temp. indicator

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. The following equipments shall be calibrated at a frequency shown against each and records kept:

1.1.1 Universal Testing Machine - Once in a year

1.1.2 Impact Testing Machine- Once in three years

1.1.3 Pressure Gauges - Once in a month

1.1.4 Temperature Controllers- Once in a year

1.1.5 Timer Controllers- Once in a year

1.1.6 All Measuring Instruments- Once in a year

1.1.7 Master gauges against which inspection gauges are checked periodically shall be sent for rechecking in an independent laboratory once in three years.

1.2 The firm shall procure a set of certified gauges for inspection of different components.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity. Records of all the tests made at the valve manufacturer's works shall be kept and copies of test certificates shall be forwarded to the purchaser of the valve and the inspecting authority.

3. LABELLING AND MARKING – As per the requirements of IS 7302:2018.

4. CONTROL UNIT – For the purpose of this scheme, Lot/Batch is defined as:

Lot/Batch: Quantity of Valve body blanks manufactured from same material and size manufactured under similar processes of production shall constitute a lot/batch.

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 Each control unit of finished valves shall be offered for inspection to BIS before dispatch (See Table 2). Valves failing to meet the requirements of the specification shall not be marked with the BIS Standard Mark.

5.2 A certificate as per ANNEX-I shall be issued by the BIS Certification Officer in respect of every lot/batch of valves marked with BIS Standard Mark.

5.3 The manufacturer shall maintain a system of works inspection at all stages of manufacture to ensure that the individual valve fittings are free from all manufacturing defects and comply in all respect with the requirements of the Indian Standards Specification.

5.4 One sample of each consignment of raw materials received in the factory shall be analyzed for chemical composition. The composition shall be such that the material shall be compatible under the conditions of service with the gas to be contained in the cylinder and complies with the declaration submitted at the time grant of license or inclusion.

5.5 The material shall conform to the requirements specified in 4 of IS 7302:2018. A test certificate shall be supplied by the supplier with the supply of the material for the valve fabrication. BIS shall be given the opportunity of making an independent check test, if necessary. The manufacturer of the valves should establish means to identify the valves with the certificate. Material with seams, cracks, lamination or other injurious defects shall not be used.

5.6 **DESIGN** - At the time of design approval the valves shall be checked for conformity to all the requirements of the specification. Whenever there is a change in material or design of the valve it shall be retested and shall conform to all the requirements of IS 7302:2018.

5.7 In respect of all other clauses of the specification at all stages of production, appropriate controls and checks shall be maintained by the factory so as to ensure that the product conforms to the various requirements of the specification.

6. FORGING & MACHINING - The licensee shall possess all the requisite infrastructure for the forging and machining of the valve housing in their own premises. Under no circumstances, the forgings of valve housing (body) or machining there of shall be permitted to be sub-contracted or bought from outside.

7. 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: Required (R) or Sub contracting permitted (S)	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
4	MATERIAL						
	Chemical Composition						
	Valve Body	4.2	IS 7302	S	One	Each Consignment	No further testing is required, if accompanied with test certificate or ISI marked. The approved material as per drawing shall only be used.
	Mechanical Properties						
	Tensile Strength and Elongation	4.2.1, 9.1	IS 7302	R	As per Table 5A of IS 7302		--
	Impact Strength	4.2.2, 9.2	IS 7302	R			
4.4	Protective finishes (if used)	4.4	IS 7302	R	One	Each Control Unit	--
5	Valve Design Requirement						
5.1	General criteria	5.1.1 to 5.1.6	IS 7302	R	One	Each Control Unit	
6	Valve Inlet connection	6, 9.4	IS 7302	R	As per Table 5B of IS 7302		Thread shall be checked with approved gauges as applicable to types of thread.
7	Valve Outlet Connection	7, 9.5	IS 7302	R			

8	Type Tests						
	Mechanical Strength						
	Valve Burst Pressure Test	8.6.1 Table 1	IS 7302	R	One	Once in a year or whenever there is a design change, whichever is earlier.	--
	Resistance to Mechanical Impact (Valve Impact Test)	8.6.2 Table 1	IS 7302	R	One		--
	Valving Torque Test	8.6.3 Table 1	IS 7302	R	One		--
	Excessive Torque Test	8.6.4 Table 1	IS 7302	R	Four		--
	Leak Tightness Test	8.7 Table 1	IS 7302	R	Five		--
	Endurance Test	8.8 Table 1	IS 7302	R	Five		--
	Visual examination	8.9 Table 1	IS 7302	R	To be done on samples after endurance test and subsequent leak test		--
	Flame Impingement Test	8.10 Table 1	IS 7302	R	One		--
9	Production Inspection and Testing						
	Internal and External Tightness test	9.3	IS 7302	R	Each Valve		
	Checking of other dimensions	9.6	IS 7302	R	As per Table 5A of IS 7302		

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.

Table 2

(Cl. 5.1 of SIT)

INSPECTION OF FINISHED LOT

Lot – For the purpose of lot inspection, the lot shall be the same as the Control Unit defined in Clause 4 of the Scheme of Inspection and Testing.

1. Depending upon the size of the lot, samples as per Cl. 9.3, Cl. 9.4, Cl. 9.5 and Cl. 9.6 shall be drawn at random and subjected to the test for Internal and External Tightness Test (Cl. 9.3), Valve inlet connections (Cl. 9.4), Valve outlet connections (Cl. 9.5) and Checking of other dimensions (Cl. 9.6) respectively.
2. Number of samples for the above tests will be as follows:
 - a) Valve inlet connections (Cl. 9.4)- As per table 5B of IS 7302
 - b) Valve outlet connections (Cl. 9.5)- As per table 5B of IS 7302
 - c) Checking of other dimensions (Cl. 9.6)- As per table 5A of IS 7302
 - d) Internal and External tightness (Cl. 9.3)- as given below

Batch Size	Sample Size
Up to 500	13
501 to 1000	20
Over 1000	32

In case of failure of a sample in any requirement mentioned under 1, all the valves in the batch should be tested by the licensee for the requirement where failure has occurred and segregated batch be reoffered for BIS Inspection as fresh batch. A batch can be reoffered only once. All rejected valves shall be scrapped.

3. The lot may be considered as having passed the requirements of IS 7302:2018 if all the samples tested above are found to be conforming.

NOTE:

1. Tensile Strength, Elongation and Impact Strength of the material of valve body as per frequency given in Table 1 of SIT shall be carried out by the licensee. BIS officer will verify the relevant test records before carrying out lot inspection. However, such tests to be witnessed by BIS officer whenever possible.

ANNEX – I

(Para 5.2 of the Scheme of inspection and Testing)

Test Certificate for Valve fittings for Self-Contained Breathing Apparatus (SCBA) and Self-Contained Underwater Breathing Apparatus (SCUBA)- IS 7302

Manufacturer:		Certificate No.		
Purchaser:		Order No:		
Control unit No:				
Valve description		Quantity offered for Inspection:		
This is to certify that the valve fittings as mentioned below were inspected at M/s_____ meet the requirements of IS 7302:2018 and Drawing No._____.				
RESULTS OF INSPECTION :				
Sr. No	Requirements	Quantity Inspected	Quantity Passed	Quantity Rejected
1	Valve inlet (Cl. 9.4)			
2	Valve outlet (Cl. 9.5)			
3	Internal/External leak test (Cl. 9.3)			
4*	Tensile strength and elongation tests			
5*	Impact strength test			
* From manufacturer's test record.		Batch No.	Satisfactory	
Quantity Passed				
Rejected valve fittings and the method of their disposal				
Signature:		Signature		
Name & Designation of the Officer representing the company		Inspecting Officer Bureau of Indian Standards		

ANNEX C**Scope of Licence**

“Licence is granted to use Standard Mark as per IS 7302:2018 with the following scope:	
Name of the product	Valve fittings for Self-Contained Breathing Apparatus (SCBA) and Self-Contained Underwater Breathing Apparatus (SCUBA)
Type of valve (SCBA/SCUBA)	
Type of thread on valve inlet (Type 1/2/4 and corresponding size)	
Outlet connections	1. SCBA Valves Gas to be used – Working pressure up to bar 2. SCUBA Valves Maximum working pressure-
Type of gas/mixture of gas	
Any other aspect	PESO approved drawing number and approval number