



उत्पाद मानुयल

मापित ईंधन परिक्षेपक हेतु रबर होसेस और होज समुच्चय- विशिष्टि
IS 2396:2017/ISO 5772:1998 के अनुसार

**PRODUCT MANUAL FOR
RUBBER HOSES AND HOSE ASSEMBLIES FOR MEASURED FUEL DISPENSING-
SPECIFICATION ACCORDING TO IS 2396:2017/ISO 5772:1998**

भारतीय मानक ब्यूरो) अनुरूपता मूल्यांकन (विनियम 2018 की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरणके प्रचलन मे रीति और पारदर्शिता के सुसंगता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप मे उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज का उपयोग किया जा सकता है।

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 license/certificate.

1	उत्पाद Product	:	IS 2396:2017/ISO 5772:1998
	शीर्षक Title	:	Rubber Hoses and Hose Assemblies for Measured Fuel Dispensing- Specification
	संशोधन संख्या No. of Amendments	:	Nil
2	नमूनाकरण दिशा निर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	Manufacturer to submit declaration/undertaking in compliance to Clause 3 of IS 2396:2017/ISO 5772:1998
b)	समूहिकरण दिशा निर्देश Grouping guidelines	:	कृपया Annex-A देखें Please refer ANNEX-A
c)	नमूने का परिमाण Sample Size	:	5 metres Proof pressure test and Electrical Resistance test using electrically conducting compounds to be done on full length of hose or hose assembly shall be conducted as part of factory testing.
3	परीक्षण उपकरणों की सूची List of Test Equipment	:	कृपया Annex-B देखें Please refer ANNEX-B
4	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	कृपया Annex-C देखें Please refer ANNEX-C

5	एक दिन में संभावित परीक्षण Possible tests in a day :	:	i) Internal diameter ii) Minimum thickness of lining and cover iii) Cut Lengths iv) Proof pressure v) Burst pressure vi) Volumetric expansion vii) Tensile strength: a) Lining, b) Cover viii) Elongation at break: a) Lining, b) Cover ix) Pull-off test
6	लाइसेंस का कार्यक्षेत्र / Scope of the Licence:		
	IS 2396:2017/ISO 5772:1998 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेंस निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है: Licence is granted to use standard Mark as per IS 2396:2017/ISO 5772:1998 with the following scope:		
	उत्पाद का नाम Name of the product	Rubber Hoses And Hose Assemblies For Measured Fuel Dispensing	
	Type(s)	(i) Type 1; and/or (ii) Type 2; and/or (iii) Type 3	
	Size (Nominal bore and internal diameter)	... mm up to and including ... mm (to be indicated for each type) (as per provisions of Table 1 of IS 2396:2017/ISO 5772:1998)	

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ANNEX-A
GROUPING GUIDELINES
**FOR RUBBER HOSES AND HOSE ASSEMBLIES FOR MEASURED FUEL DISPENSING-
SPECIFICATION ACCORDING TO IS 2396:2017//ISO 5772:1998**

1. Following grouping guidelines shall apply for Grant of Licence (GoL) / Change in Scope of Licence (CSoL):
For considering grant of licence/inclusion, sample of each type (as per Clause 1 of IS 2396:2017/ISO 5772:1998) and any nominal bore and internal diameter (as per table 1 of IS 2396:2017/ISO 5772:1998) may be tested to cover all the hoses being manufactured, subject to availability of testing and manufacturing facilities.
2. The manufacturer shall declare compliance to the pressure requirements as per Clause 4 of IS 2396:2017), in their application for considering grant of licence and/or change in scope of licence.
3. It shall be ensured that the firm is having all the necessary manufacturing and testing facilities for the nominal bores and internal diameter to be included in the licence.
4. During the operation of licence, BO shall ensure that all the nominal bores and internal diameter covered in the Licence are tested in rotation, to the extent possible.

ANNEX – B
LIST OF TEST EQUIPMENT

**FOR RUBBER HOSES AND HOSE ASSEMBLIES FOR MEASURED FUEL DISPENSING-
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Major test equipment required to test as per the Indian Standard

Sl. No	Tests used in with Clause Reference	Test Equipment
1	Internal diameter, Cl. 5.1, Table 1	Vernier Calipers, Internal Diameter Gauge
2	Minimum thickness of lining and cover, Cl. 5.2	Micrometer/Thickness gauge
3	Cut Lengths, Cl. 5.3	Steel Scale or Measurement Tape
4	Proof pressure, Cl. 6, Table 2	Dial Pressure Gauge, Calibrated pressure gauge or pressure transducer with digital readout, Dimensional equipment, sliding vernier caliper or micrometre, length measuring tape, circumferential measuring tape (π tape)
5	Burst pressure, Cl. 6, Table 2	Dial Pressure Gauge, Calibrated pressure gauge or pressure transducer with digital readout, Dimensional equipment, sliding vernier caliper or micrometre, length measuring tape, circumferential measuring tape (π tape)
6	Volumetric expansion, Cl. 6, Table 2	Test apparatus as per Fig. 1 of ISO 6801 (consisting of tank-vented at top, valve A, pressure gauge, pressure source, valve B, test piece, valve C, burette, valve D, Steel Hydraulic Tube of Dia 6.3 mm and wall thickness 1.52 mm minimum), Dial Pressure Gauge
7	Adhesion between components on: a) unaged hoses, b) aged hoses, Cl. 6, Table 2	Dynamometer, Grips, Mandrel, cutting blade,
8	Ambient-temperature flexibility, Cl. 6, Table 2	<u>Method A</u> Apparatus consisting of two guides A and B, guide A being fixed in a plane and guide B being movable in that plane parallel to and in line with guide A (as per figure 1 of ISO 1746) OR <u>Method B</u> Compression testing machine, Pair of twin channel-shaped holders, thermostatically controlled environmental chamber
9	Low-temperature flexibility, Cl. 6, Table 2	Mandrel, Conditioning chamber

10	Tensile strength: a) Lining b) Cover Cl. 6, Table 2	Dies and cutters, Thickness gauge, Cone gauge, Tensile Testing Machine, Test rig for ring test pieces
11	Elongation at break, a) Lining b) Cover. Cl. 6, Table 2	Dies and cutters, Thickness gauge, Cone gauge, Tensile Testing Machine, Test rig for ring test pieces
12	Accelerated ageing: a) Tensile-strength change for lining and cover, b) Elongation at break change for lining and cover Cl. 6, Table 2	Ageing Oven equipped with Flow meter and Digital temperature controller,
13	Abrasion resistance (cover compound) Cl. 6, Table 2	Abrasion Machine, Abrasive sheet, Hollow drill, Balance(LC _± 1 mg.), Standard reference compounds
14	Resistance to liquids: a) Lining swell b) Lining extracted matter c) Cover swell, Cl. 6, Table 2	Method A – Glass vessel of flange type with glass lid, having a ground surface where it seals to the vessel flange and clamped by suitable means OR Method B – Glass vessel with stopper or lid OR Method C – Glass vessel with reflux condenser. OR Method D – Pressure vessel with hermetically closed lid, OR Method E – Apparatus for testing one surface only which holds the test piece in contact with the liquid(as per Fig 2 of ISO 1817:2022
15	Ozone resistance of cover, Cl. 6, Table 2	Ozone cabinet with apparatus for generating ozone, monitoring and controlling the ozone concentration, Test piece holder(as shown in Figure 1 of ISO 7236), Test piece holder(as shown in Figure 2 of ISO 7236)
16	Electrical resistance using electrically conducting compounds, Cl. 6, Table 2	Insulation resistance measuring instrument having a nominal open-circuit voltage of 500 V d.c., Ohmmeter with a capacity of $10^{12} \Omega/10^{10} \Omega$ and sufficiently accurate to determine the resistance to within $\pm 10\%$, 4.5 V battery, 4 V(0.3 A) test lamp, conductive silver lacquer or colloidal graphite or conductive liquid(consisting of anhydrous polyethylene glycol, water, wetting agent and potassium chloride), Outer electrode: a copper sheet-metal band of standard width 25 mm clamped around the outer hose wall, inner electrode, conditioning chamber,
17	Pull-off test Cl. 6, Table 2	Test rig, tensile machine, Stop watch

This is an indicative list and may not be taken as being exhaustive

ANNEX C
SCHEME OF INSPECTION AND TESTING
FOR RUBBER HOSES AND HOSE ASSEMBLIES FOR MEASURED FUEL
DISPENSING- SPECIFICATION ACCORDING TO IS 2396:2017/ISO 5772:1998

- 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 and implement 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. PACKING AND MARKING** – The Standard Mark, as given in the Schedule of the licence, shall be printed on the container or the label applied to it, provided always that the product so marked conform to requirements of the specification.
 - 3.1 Packing** - The hose shall be packed as agreed between the purchaser and the supplier, in line with the provisions of National Annex-A of IS 2396:2017.
 - 3.1 Marking** - The information as mentioned under clause 9.1 and 9.3 (in case of short assemblies of less than 2 m) of IS 2396:2017, shall be legibly and indelibly marked on each hose. Each coupling shall be legibly and indelibly marked with the information as mentioned under clause 9.2 of IS 2396:2017. In addition, the following shall be incorporated on each hose:
 - (i) BIS Licence No. CM/L --.
 - (ii) BIS website details i.e. —”For details of BIS certification please visit www.bis.gov.in”.
- 4. CONTROL UNIT** – For the purpose of this scheme, all the rubber hoses of the same type, manufactured from a rubber compound masticated and vulcanized in a day, shall constitute a control unit.
 - 4.1** The batch shall be considered fit for the purpose of marking if sample taken from control unit and tested as in Table 1 is found to conform to the relevant requirements of the specification.
 - 4.2** In case the sample fails to conform to any of the requirements as laid down in the specification, the entire material in the batch shall be considered as unfit for the application of the Certification Mark of the Bureau. The batch could, however, be reprocessed and then retested for compliance with the specification.
- 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 (LEVELS OF CONTROL)
(Para 5 of Scheme of Inspection and Testing)

(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	IS				
5.1	Internal diameter	5.1	IS 2396: 2017	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
5.2	Minimum thickness of lining and cover	5.2	IS 2396: 2017	R	-do-		
5.3	Cut Lengths	---	ISO 1307	R	-do-		
Physical Properties							
Cl. 6, Table 2	Proof pressure	---	ISO 1402	R	Each hose		
Cl. 6, Table 2	Burst pressure	---	ISO 1402	R	One	Once in a month	
Cl. 6, Table 2	Volumetric expansion	---	ISO 6801	R	One	Once in a week	
Cl. 6, Table 2	Adhesion between components on: a) unaged hoses,	---	ISO 8033	R	One	Once in a week	

	b) aged hoses,						
Cl. 6, Table 2	Ambient-temperature flexibility	---	ISO 1746	R	One	Every control unit	
Cl. 6, Table 2	Low-temperature flexibility	---	ISO 4672 (method B)	S	One	Every 6 months	
Cl. 6, Table 2	Tensile strength: a) Lining b) Cover.	---	ISO 37	R	One	Once in a week	
Cl. 6, Table 2	Elongation at break, a) Lining b) Cover	---	ISO 37	R	One	Once in a week	
Cl. 6, Table 2	Accelerated ageing: a) Tensile-strength change for lining and cover, b) Elongation at break change for lining and cover	---	ISO 188	R	One	Once in a week	
Cl. 6, Table 2	Abrasion resistance (cover compound)	---	ISO 4649 (Method A)	R	One	Once in a month	
Cl. 6, Table 2	Resistance to liquids: a) Lining swell b) Lining extracted matter c) Cover swell	---	ISO 1817	R	One	Once in a month	
Cl. 6, Table 2	Ozone resistance of cover	---	ISO 7326	S	One	Every 6 months	Also at the time of change in composition/ material

Cl. 6, Table 2	Electrical resistance using electrically conducting compounds	---	ISO 8031	R	One	Once in a week	
Cl. 6, Table 2	Pull-off test	Annex-A	IS 2396: 2017	R	One	Every control unit	

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled 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 the approval by BO Head.