PRODUCT MANUAL
FOR RUBBER HOSE FOR LIQUIFIED PETROLEUM GAS (LPG)- SPECIFICATION
PART 2 DOMESTIC AND COMMERCIAL APPLICATION
ACCORDING TO IS 9573 (Part 2): 2017

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 9573 (Part 2): 2017
	Title	:	Rubber Hose for Liquified Petroleum Gas (LPG)- Specification Part 2 Domestic and Commercial Application
	No. of Amendments	:	01
2.	**Sampling Guidelines:**		
a)	Raw material	:	As per Clause 4 of IS 9573 (Part 2)
b)	Grouping guidelines	:	Sample of any nominal size may be tested to cover all sizes being manufactured subject to availability of testing and manufacturing facilities.
c)	Sample Size	:	5 metres
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 :**	:	Construction, Dimensional measurement, Tensile strength, Grip strength test (excluding time required for vulcanization of test pieces)
6.	**Scope of the Licence :**		
	Licence is granted to use Standard Mark as per IS 9573 (Part 2): 2017 with the following scope:		
	Name of the product		Rubber Hose for Liquified Petroleum Gas (LPG)- Specification Part 2 Domestic and Commercial Application
	Nominal Sizes		in mm

ANNEX-A

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LIST OF TEST EQUIPMENTS
Major test equipment required to test as per the Indian Standard

Sr. No.	Tests used in with Clause reference	Testing Equipment
1.	Bore Size, 4.3.1	Vernier Calipers, Internal Diameter Gauge
2.	Thickness of lining and cover, 4.3.2	Micrometer/Thickness gauge
3.	Length, 4.3.3	Steel Scale or Measurement Tape
4.	Tensile strength and elongation at break of lining and cover compound of hose, 4.4.1	Dies and cutters, thickness gauge, cone gauge, Tensile Testing Machine with extensometer, Test rig (for ring test pieces)
5.	Accelerated Ageing Test, 4.4.2	Air Oven (Cell type oven or Cabinet Oven or forced air circulation oven of type 1 or 2 as per IS 3400 Part 4)
6.	Resistance of lining to n-pentane, 4.4.3	Liquid n-pentane, Weighing Balance
7.	Adhesion, 4.5.1	Apparatus for determination of adhesion consisting of a Test Machine, Grips, Mandrels as per IS 3400 (Part 24)
8.	Low Temp Flexibility, 4.5.2	Freezer capable of maintaining temperature of -40±2°C, Mandrels of suitable sizes
9.	Flexibility of Hose, 4.5.3	Calipers, Mandrels
10.	Ozone resistance, 4.5.4	Ozone cabinet capable of maintaining ozone concentration of 50± 5 pphm and temperature of 40±2°C, magnifying lens (2X), Test piece holder as per Fig 1 of IS 9573 (Part 2), Scale or measuring tape, calipers, Caps
11.	Proof pressure test, 4.5.5.1	Pressure source, calibrated pressure gauge or pressure transducer with digital readout, sliding vernier calipers or micrometer, length measuring tape, circumferential measuring tape (π tape) as per IS 443 (Part 3):2017
12.	Bursting pressure, 4.5.5.2	-do-
13.	Grip Strength, 4.5.6	Grip strength test setup consisting of Standard Nozzle as per Fig 2 and Oversize Nozzle as per Fig 3 of IS 9573 (Part 2), hooks, 4.5 Kg Test Mass

14.	Burning Behaviour, 4.5.7	Test piece rig as per Fig 4 of IS 9573 (Part 4), Bunsen Burner

The list above is indicative and may not be taken as exhaustive

ANNEX – B

SCHEME OF INSPECTION AND TESTING
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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. **PACKING AND MARKING** – The Standard Mark as given in the Schedule of the license shallbemarked on each length of hose; provided that the hoses to which this mark is thus applied conforms to every requirement of the specification.

3.1 Marking and packing shall be done as per the provisions of the Indian Standard. In addition, the following details shall be mentioned on each length of hose. (In case space is not available on the hose it may be marked on the external packaging or on an attached label as well):

a) BIS Licence No. CM/L _____.

b) 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 manufactured from a rubbercompound masticated and vulcanized at a timeshall 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 LEVELS OF CONTROL
(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/Clause Reference			No. of Sample	Frequency	Remarks
4	**Requirements**						
4.1	General	4.1	IS 9573 (Pt 2)	R		Each hose	
4.2	Material						
4.2.1	Lining	4.2.1	-do-	R		Each hose	
4.2.2	Reinforcement	4.2.2	-do-	R		Each hose	
4.2.3	Cover	4.2.3	-do-	R		Each hose	
4.3	**Dimensional Tolerances**						
4.3.1	Bore Size,	4.3.1	IS 9573 (Pt 2)	R	6	Each control unit	The reading shall be taken on aset of six test pieces cut fromdifferent sections
4.3.2	Thickness of lining and cover	4.3.2	-do-	R	6	Each control unit	-do-
4.3.3	Length	4.3.3	-do-	R	6	Each control unit	Length as agreed to betweenpurchaser and manufacturer.
4.4	**Physical Requirements**						
4.4.1	Tensile strength and elongation at break of lining and cover		IS 3400 (Pt 1)	R	3	Each control unit	

	compound of hose						
4.4.2	Accelerated Ageing Test,		IS 3400 (Pt 4)	R	1	Once a week	
4.4.3	Resistance of lining to n-pentane,	Annex A	IS 9573 (Pt 2)	R	1	Each control unit	
4.5	**Performance Requirements**						
4.5.1	Adhesion,		IS 3400 (Pt 24)	R	2	Each control unit	
4.5.2	Low Temp Flexibility,	4.5.2	IS 9573 (Pt 2)	S	1	Every6 months*	*Also at the time of change in composition/material
4.5.3	Flexibility of Hose,	4.5.3	-do-	R	1	Each control unit	
4.5.4	Ozone resistance,	4.5.4	-do-	S	1	Every6 months*	*Also at the time of change in composition/material
4.5.5	Hydraulic Test requirement						
4.5.5.1	Proof pressure test,	8.1	IS 443 (Part 3)	R		Each hose	
4.5.5.2	Bursting pressure,	8.3	IS 443 (Part 3)	R	1	Each control unit	
4.5.6	Grip Strength,	Annex B	IS 9573 (Pt 2)	R	1	-do-	
4.5.7	Burning Behaviour,	Annex C	-do-	R	1	-do-	

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