केंद्रीय मुहर विभाग - III

हमारा संदर्भ- **केन्द्रीय मुहर विभाग-3/16: IS 15100** **04 04 2018**

**विषय: IS 15100 : 2018 के अनुपालन हेतु एस टी आई**

1. इस उपरोक्त विषय का संदर्भ प्राप्त है।
2. सक्षम प्राधिकारी ने उपरोक्त **एस टी आई** को अनुमोदित कर दिया है।
3. सभी शाखा कार्यालय से आग्रह है कि उपरोक्त **एस टी आई** का अनुपालन सुनिश्चित करें।

(अमित कुमार)
वैज्ञानिक 'सी' (सी एम डी-III)

**प्रमुख (सी एम डी-III)**
सभी क्षेत्रीय/शाखा कार्यालय
आई टी एस विभाग — बीआईएस इंट्रानेट पर अपलोड करने हेतू

**CENTRAL MARKS DEPARTMENT-III**

Our Ref: **CMD-3/16: IS 15100** **04 04 2018**

**Subject: STI for implementation of Revised IS 15100: 2018**

1. This has reference to the subject stated above.

2. The above STI have been approved by the Competent Authority.

3. All ROs/BOs are requested to ensure the implementation of the above STI.

Amit Kumar
Sc. C (CMD III)

Head (CMD III)

Circulated to: All ROs/BOs
Copy to: ITS for hosting on Intranet

# SCHEME OF TESTING AND INSPECTION FOR CERTIFICATION OF MULTI – FUNCTION VALVE ASSEMBLY FOR PERMANENTLY FIXED LIQUIFIED PETROLEUM GAS (LPG) CONTAINERS FOR AUTOMOTIVE USE ACCORDING TO IS 15100 (*First Revision*)

## 1. LABORATORY

**1.0 LABORATORY**– A laboratory shall be maintained which shall be suitably equipped and staffed, where different tests given in the Specification shall be carried out in accordance with the methods given in the Indian Standard.

**1.1** All testing instruments/equipments shall be periodically checked and calibrated. Records of such checks/calibration shall be maintained.

**1.1.1** Tensile testing machines shall be calibrated once in a year. Izod impact testing machine shall be calibrated at least once in three years.

**1.1.2** Various pressure gauges used shall be calibrated at least once in a month.

**1.1.3** The firm shall procure a set of certified gauges for inspection of different components and get them calibrated at the periodicity decided by the BIS. Master gauge against which inspection gauge are checked periodically shall be sent for rechecking in an independent laboratory once in three years.

**1.1.4** The pyrometer used for heat treatment furnace shall be calibrated once in every six months.

## 2. TEST RECORDS

**2.1** All records of tests as per this Scheme of Testing and Inspection shall be kept in suitable forms.

**2.2** Copies of any such records that may be required by BIS shall be made available at any time on request.

## 3. QUALITY CONTROL

**3.1** It is recommended that, as far as possible, Statistical Quality Control (SQC) methods may be used for controlling the quality of the product during production as envisaged in this Scheme. [See IS 397(various parts).

**3.2** In addition, effort should be made to gradually introduce a Quality Management System in accordance with IS/ISO 9001.

## 4. STANDARD MARK

**4.1** The Standard Mark, as given in Column (1) of the First Schedule of the licence shall be marked on each multi-functional valve provided always that the valve to which the Standard Mark is applied conforms to every requirement of the specification.

## 5. OTHER MARKING

**5.1** In addition to the Standard Mark, information as per *clause* **10** of IS 15100 shall be permanently and legibly stamped on each valve body, which shall be visible on the valve from the top.

**5.2** The following information shall also be marked at prominent place on the valve body.

(a) Serial number
(b) Control unit number indicating raw material batch identity and day's production identity.

## 6. LEVEL OF CONTROL

### 6.1 CONTROL UNIT

For the purpose of this scheme, a lot of forged valve bodies of the same type and size forged in a day from the material of the same supplier under similar process of production shall constitute a control unit.

**6.2** The tests and inspection indicated in **Table 1** attached and at the levels of control specified there in, shall be carried out on the whole production which is covered by this scheme and appropriate records maintained in accordance with *clause* 2 above and charts may be maintained as per clause 3 above. All the production which conforms to the Indian Standard and covered by the licence shall be marked with Standard Mark.

6**.3** 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.

**6.3.1** A certificate as per Annex-IA & IB shall be issued by BIS in respect of valves approved for marking with BIS Standard Mark.

**6.4** 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 respects with the requirements of the Indian Standard Specification.

### 6.5 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.

### 6.6 BOUGHT OUT COMPONENTS

All other components manufactured/bought from outside shall be inspected by the licensee as per details given in Table 2 and records maintained by the licensee.

**6.7 DESIGN AND FABRICATION** – The valve shall conform to all the requirements given in *clauses* **5 & 6** of IS 15100.

**6.7.1** Type approval shall be given as mentioned in *clause* **8** of IS 15100.

## 7 MATERIAL:

The manufacturer shall declare in their scheme of manufacture/drawing the relevant specification/chemical composition of the raw material (Brass) used for valve body and shall meet the requirement of forgings as given in IS 15100.

**7.1** One sample from each consignment of raw material received in the factory shall be analysed for chemical composition. The composition shall be such that the material is compatible under the conditions of service with LPG. If the material is accompanied by a test certificate, further testing is not required. The manufacturer of the valve shall establish means to identify the valve with the raw material certificate. Material with seams, cracks, lamination or other injurious defects shall not be used.

**7.2** The relevant specification for the raw material for other components shall also be declared by the manufacturer and clearly indicated in their drawings and scheme of manufacture.

**7.3** In respect of all other clauses of the specification and at all stages of manufacture, the factory shall maintain appropriate control and checks to ensure that their products conform to various requirements of the specification.

**7.4** Wherever the raw material used is under the Mandatory Certification of BIS, the raw material shall be necessarily ISI marked and no further testing is required. Wherever the raw material used is not under the Mandatory Certification of BIS, no further testing is required if accompanied with the Test Certificate or ISI marked.

## 8. REJECTIONS

**8.1** A separate record shall be maintained giving information relating to the rejection of the production not conforming to the requirements of the Specification and the method of disposal. Such material shall in no case be stored together with that conforming to the Specification.

## 9. SAMPLES

**9.1** The licensee shall supply, free of charge, the samples required in accordance with the Bureau of Indian Standards (Certification) Regulations, 1988, as amended from time to time, from the factory or godown. BIS may draw samples from the open market, if available.

## 10. REPLACEMENT

**10.1** Whenever a complaint is received soon after the goods with Standard Mark have been purchased and used, and if there is adequate evidence that the goods have not been misused, defective goods shall be replaced free of cost by the licensee in case the complaint is found to be genuine and the warranty period (where applicable) has not expired. The final authority to judge the conformity of the product to the Indian Standard shall be with BIS.

**10.2** In the event of any damage caused by the goods bearing the Standard Mark, or any claim being filed by the consumers against BIS Standard Mark and not "conforming to" the relevant Indian Standard, entire liability arising out of such non-conforming product shall be of the licensee and BIS shall not in any way be responsible in such cases.

## 11. STOP MARKING

**11.1** The marking of the product shall be stopped under intimation to BIS if, at any time, there is some difficulty in maintaining the conformity of their product to the Specification, or the testing equipment goes out of order or due to any other reason. The marking may be resumed as soon as the defects are removed under intimation to BIS.

**11.2** The marking of the product shall be stopped immediately if directed to do so by BIS for any reason. The marking may then be resumed only after permission by BIS. The information regarding resumption of marking shall also be sent to BIS.

## 12. PRODUCTION DATA

The licensee shall send to BIS a statement of quantity produced, marked and exported by him and the value thereof at the end of each operative year of the licence as per the enclosed proforma which has to be authenticated by a Chartered Accountant.

## TABLE 1 LEVELS OF CONTROL

**Para 6 of the Scheme of Testing and Inspection)**

| TEST DETAILS | | | | LEVELS OF CONTROL | | |
|---|---|---|---|---|---|---|
| **Cl.** | **Requirement** | **Test Methods** | **No. of samples** | **Lot Size** | **Frequency** | **Remarks** |
| | | **Clause Reference** | | | | |
| **TESTS ON SUB ASSEMBLIES** | | | | | | |
| 3.1.3 | Excess Flow Check Valve | 3.1.3 IS 15100 | One | One Consignment | Each Consignment | In case the material is ISI marked or accompanied with a test certificate, no further testing is required |
| 3.1.4.1 | Pressure Relief Valve | 3.1.4.1 IS 15100 | One | One Consignment | Each Consignment | |
| 3.1.4.2 | Fusible Plug | 3.1.4.2 IS 15100 IS 5903 | Three | One Consignment | Each Consignment | |
| 3.1.5 | Contents Gauge (*Pressure test of Float at 3 MPa*) | 3.1.5.3 IS 15100 | One | 5000 pieces or part thereof | Each Consignment | |
| 3.2 | Filler Connector | 3.2 IS 15100 | One | One Consignment | Each Consignment | Leak Test to be conducted at 2 MPa |
| 3.2.1 | Filler Cap | 3.2.1 IS 15100 | One | One Consignment | Each Consignment | |
| 3.2.2 | Filler Non-Return Valve | 3.2.1 IS 15100 | Each Valve | | | Leak Test to be conducted at 0.05 MPa and 2 MPa |
| **4** | **MATERIAL** | | | | | |
| 4.1, 4.2 | Material | As declared | One | One Consignment | Each Consignment | In case the material is ISI marked or accompanied with a test certificate, no further testing is required (Please see *clause* **7.4** of STI also) |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **Forgings** | | | | | |
| | Tensile Strength and Elongation | 4.1.1 IS 15100 | As per sampling plan provided in 4.2 of IS 15100 | One Control Unit | Each Control Unit | If any of the sample fails, retesting shall be done as per *clause* **4.2.2.2** of IS 15100 |
| | Impact Strength | 4.1.2 IS 15100 | | | | |
| 4.3 | LPG compatibility test for rubber and moulded parts | 9.9 IS 15100 | One | One Consignment | Each Consignment | In case the material is accompanied with a test certificate, no further testing is required. |
| 4.4 | Test for susceptibility to season cracking | 4.4 IS 15100 | One | One Consignment | Each Consignment | |
| **5** | **CONSTRUCTION AND WORKMANSHIP** | | | | | |
| 5.2 | Dimensions of both in-house and bought out components | As per approved drawings | Sampling as per IS 2500 | One Consignment | Each Consignment | |
| 5.3 | Minimum finished wall thickness | 5.3 IS 15100 | One piece | One Control Unit | Each Control Unit | |
| 5.4 | Screw Threads | 5.4 IS 15100 | One Valve | One Control Unit | Each Control Unit | Valve threads having burrs shall be cleaned for burrs and then checked. |
| **5.5** | **CONNECTIONS** | | | | | |
| 5.5.1 | Mounting of Multi-function Valve | 5.5.1 IS 15100 | Table 2 of STI | One Control Unit | Each Control Unit | The mounting dimensions to checked with the approved drawings |
| 5.5.2 | Inlet Connections | 5.5.2 IS 15100 | Table 2 of STI | One Control Unit | Each Control Unit | To be checked on assembled valve. |
| 5.5.3 | Outlet Connections | 5.5.3 IS 15100 | Table 2 of STI | One Control Unit | Each Control Unit | To be checked on assembled valve. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Visual Smoothness free from cuts and burrs | General Checking with magnifying glass | Each Valve | - | - | Valve housing having cuts, burrs or other defects on the seat shall be rejected |
| 7,8,9 | **TESTS, TYPE APPROVAL TEST** | | | | | |
| 7.1(a) | Over Pressure Test | 9.2 IS 15100 | One piece | One Control Unit | Each Control Unit | |
| 7.1(b) | External Leakage Test at room temperature | 9.3 IS 15100 | Each Valve | | | |
| | External Leakage Test at minimum and at maximum operating temperature | 9.3 IS 15100 | One | One Control Unit | Each Control Unit | |
| 7.1(c) | High temperature test | 9.4 IS 15100 | One | 5000 pieces or part thereof | Each Lot | |
| 7.1(d) | Low temperature test | 9.5 IS 15100 | One | | | |
| 7.1(e) | Seat Leakage Test | 9.6 IS 15100 | Each Valve | | | |
| 7.1(f) | Endurance Test | 9.7 IS 15100 | One | 10000 pieces or part thereof | Every 10000 pieces or minimum once in a month | |
| 7.1(g), 9.8 | **OPERATIONAL TEST** | | | | | |
| | Operation Test for Pressure Relief Valve | 9.8.1 IS 15100 | Three pieces | One Control Unit | Each Control Unit | |
| | Operation Test for Excess Flow Valve | 9.8.2 IS 15100 | Three pieces | One Control Unit | Each Control Unit | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Operation Test for Remotely Controlled Service Valve | 9.8.3 IS 15100 | One piece | 1000 nos. or part thereof | Every 1000 pieces | |
| | Charging speed Test | 9.8.4 IS 15100 | One piece | | Once in a year | |
| | Endurance test for Fill Limiter | 9.8.5 IS 15100 | One piece | 1000 nos. or part thereof | Every 1000 pieces | Test is applicable for automatic fill limiter |
| | Vibration Test Procedure | 9.8.6.1(a) IS 15100 | Three | One control unit | Each control unit | |
| 7.1(h), 9.9 | LPG Compatibility Test | 9.9, IS 15100 Annex B | Three pieces | 1000 piece or part thereof | Each lot | |
| 7.1(j), 9.10 | Corrosion Resistance Test | 9.10, IS 15100 Annex C | One piece | | Once in a year | |
| 7.1(k), 9.11 | Resistance to Dry Heat Test | 9.11 IS 15100 | 0.25% subject to minimum of 8 | One Consignment | Each Consignment | In case the material is ISI marked or accompanied with a test certificate, no further testing is required (Please see *clause* **7.4** of STI also) |
| 7.1(m), 9.12 | Ozone Ageing Test | 9.12 IS 15100 | 0.25% subject to minimum of 8 | One Consignment | Each Consignment | |
| 7.1(n), 9.13 | Creep Test | 9.13 IS 15100 | One | 5000 valves or part thereof | Every 5000 valves or minimum once in a month | |
| 7.1(p), 9.14 | Temperature Cycle Test | 9.14 IS 15100 | One Piece | One Control unit | Once in a year | |
| 8.2 | Cycle Test | 8.2 IS 15100 | One Piece of each component | | | |
| 8.3 | Bonfire Test | 10.6.1 IS 14899 | One Piece | | Once in three year for each design/size or in case of change in design. | |

| **TYPE TESTS ON ASSEMBLED VALVES** | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9.4 | High Temperature test | 9.4 | IS 15100 | One piece | One control unit | Once in a week on assembled valve | |
| 9.5 | Low Temperature test | 9.5 | IS 15100 | One piece | One control unit | | |
| 9.8.6 | Vibration Test procedure | 9.8.6 | IS 15100 | One piece | - | Once in a year | The test is performed on assembled and tested valve. |
| 5.5.1 | Mounting | 5.5.1 | IS 15100 | According to sampling plan given in table 2 of STI | One control unit | Each control unit | The mounting dimension to be checked with the approved drawing of the manufacturer. |

TABLE 2

INSPECTION OF FINISHED LOT:

After testing and inspection by the firm, each lot shall be offered to BIS for release. Number of valves shall be selected by BIS officer as per sampling plan given below. The selected valves shall be tested for the requirements given in *clause* 5.1, 5.5.2, 5.5.3, 9.3.1, 9.3.2(a), 9.3.3, 9.3.4, 9.6 & 10.1 of IS 15100.

| **Lot Size** | **No. of valves to be tested** | **Remarks** |
|---|---|---|
| Upto 500 valves | 20 | In case of any failure observed the lot shall be reoffered by the manufacturer after complete recheck. Any repeat failure shall result in the rejection of the whole lot. Lot can be reoffered only once. All rejected valves shall be scrapped. |
| 501-1000 | 32 | |
| 1001-3000 | 50 | |
| 3001-10000 | 80 | |
| 10001-25000 | 125 | |
| 25001 and above | 125 + (2 nos. per each additional thousand or part thereof) | |

NOTE:

a) One valve from the selected samples shall be tested for Over Pressure Test (Hydro-static test) at 4.5 MPa as per clause 9.2 of IS 15100.

b) One valve from the selected sample shall be tested for High Temperature Test as per *clause* **9.4** and Low Temperature Test as per *clause* **9.5** of IS 15100.

c) Three valves from the selected sample shall be tested for Operation Test for Pressure Relief Valve as per *clause*s **9.8.1.2, 9.8.1.3, 9.8.1.4** and Operation Test for Excess Flow Check Valve as per *clause* **9.8.2.1 to 9.8.2.10** of IS 15100.

d) One valve per lot of 1000 nos. or part thereof shall be tested for Operation Test of Remotely Controlled Service Valve as per *clause* **9.8.3.1, 9.8.3.2, 9.8.3.3** and Endurance Test for Fill Limiter as per *clause* **9.8.5** of IS 15100.

e) Also, once in a year, one valve shall be tested for Vibration Test of Fill Limiter as per *clause* **9.8.6.**

f) During inspection by Bureau, if valves are found with defects like burrs on valve inlet or outlet connection etc., which may likely to effect the results of inspection, the firm may be advised to segregate/rectify such valves and reoffer for inspection.

g) All those tests which licensee is carrying out as per STI and are not carried out by BIS during lot inspection shall be conducted in presence of BIS officer as far as possible.

h) BIS officer shall witness testing of valve forgings for physical requirement as per *clause* **4.1.1 and 4.1.2** of IS 15100, if carried out during the visit.

## ANNEX – IA

(Para 6.3.1 of the Scheme of Testing and Inspection)

Test Certificate for Multifunction Valve Assembly for Permanently Fixed Liquefied Petroleum Gas (LPG) Containers for Automotive Use as per IS 15100

| | | | |
|---|---|---|---|
| Name of the Manufacturer | | | IS 15100  CM/L--- |
| Certificate No: | Date: | | |
| Purchaser: | | | |
| Order No. | | | |
| Control Unit No: | Batch No | | |
| Quantity offered for inspection | | | |
| **VALVE FITTINGS DESCRIPTION** | | | |
| This is to certify that the valve fittings as mentioned below were inspected at M/s. ---------- and these meet the requirements of IS 15100 and Drawing. No: | | | |
| **RESULTS OF INSPECTION** | | | |
| | **No. of Valves** | | |
| | Inspected | Passed | Rejected |
| a) Visual inspection of construction and workmanship (Clause 5.1) | | | |
| b) Valve inlet connection (Clause 5.5.2) | | | |
| c) Valve outlet connection (Clause 5.5.3) | | | |
| d) External leakage (Clause 9.3) | | | |
| e) Seat leakage test (Clause 9.6) | | | |
| f) Operational test (Clause 9.8) | | | |
| g) Overpressure test (Clause 9.2) | | | |
| h) Marking Details (Clause 10.1) | | | |
| (j) Cycle Test of Batch No. | | | |
| **From the test records of manufacturer** | | | |
| (i)Tensile Strength | | | |
| (ii) % elongation | | | |
| (iii) Impact strength | | | |
| Quantity Passed : | | | |
| Quantity of Rejected valve fittings and the method for their disposal | | | |
| Signature: | Signature: | | |
| Name & Designation of the representative of Licensee | Name and Designation Inspecting Officer of Bureau of Indian Standards | | |
| NOTE: A copy of the certificate may be sent to PESO, Nagpur | | | |

## ANNEX – IB

(Para 6.3.1 of the Scheme of Testing and Inspection)

Test Certificate for Filler Connector used with Multifunction Valve Assembly for Permanently Fixed Liquefied Petroleum Gas (LPG) Containers for Automotive Use as per IS 15100

| | | | |
|---|---|---|---|
| Name of the Manufacturer | | | IS 15100  CM/L--- |
| Certificate No: | Date: | | |
| Purchaser: | | | |
| Order No. | | | |
| Control Unit No: | Batch No | | |
| Quantity offered for inspection | | | |
| **VALVE FITTINGS DESCRIPTION** | | | |
| This is to certify that the filler connector as mentioned below were inspected at M/s. ---------- and these meet the requirements of IS 15100 and Drawing. No: | | | |
| **RESULTS OF INSPECTION** | | | |
| | **No. of Valves** | | |
| | Inspected | Passed | Rejected |
| a) Visual inspection of construction and workmanship (Clause 5.1) | | | |
| b) Leak test for joint of Filler Cap with Connector at 2 MPa (Clause 3.2.1) | | | |
| c) Leak test of non-return valve of Filler Connector at 0.05 and 2 MPa. (Clause 9.6.3) | | | |
| d) Overpressure test (Clause 9.2) | | | |
| e) Cycle Test of Batch No. | | | |
| **From the test records of manufacturer** | | | |
| (i)Tensile Strength | | | |
| (ii) % elongation | | | |
| (iii) Impact strength | | | |
| Quantity Passed : | | | |
| Quantity of Rejected filler connector and the method for their disposal | | | |
| Signature: | Signature: | | |
| Name & Designation of the representative of Licensee | Name and Designation Inspecting Officer of Bureau of Indian Standards | | |
| NOTE: A copy of the certificate may be sent to PESO, Nagpur | | | |

**PROFORMA – 1**

PROFORMA FOR OBTAINING PRODUCTION DETAILS

| | | |
|---|---|---|
| Period covered | | |
| Name of Licensee CM/L No. | | |
| Name of Articles (s) | | |
| Grade/Type/Size/Variety/Class/Rating | | IS No. |
| 1.1 | Brand/Trade/Name(s) of BIS Certification Marked Products | |
| 2.0 | Total production of the articles(s) Licensed for certification marking | |
| 2.1 | Total production of the article(s) Conforming to Indian Standard | |
| 3.0 | Production covered with BIS Certification Mark and its<br>Value : a) Quantity<br>b) Value (Rs.) | |
| 3.1 | Brand Name used on production covered under BIS Certification Mark | |
| 3.2 | Calculation of marking fee on unit-rate basis; Marking Fee per unit a)<br>Unit<br><br>(b)Quantity covered with BIS Certification Mark<br>(c )Marking fee rounded off in whole rupees as obtained by applying unit rates given in (a) on quantity given in (b)<br><br>**NOTE:** In case a clause is not applicable, suitable remarks may be given against it | |
| 4.0 | Quantity not covered with BIS Certification Mark. If any, | |
| | reasons for such non-coverage | |
| 4.1 | Brand Name under with non-certified goods were sold | |
| 5.0 | Quantity Exported with BIS Standard Mark and its value | |
| 5.1 | Brand Name under which BIS Certified goods are exported | |
| 6.0 | Authentication by Chartered Accountant | |