CENTRAL MARKS DEPARTMENT-III

Our ref: CMD-III/16: IS 15490 10 May 2023

Subject: Guidelines for Lot inspections of Seamless Steel Cylinders for On-Board Storage of Compressed Natural Gas as a Fuel for Automotive Vehicles as per IS 15490: 2017

This has reference to lot inspections of Seamless Steel Cylinders for On-Board Storage of Compressed Natural Gas as a Fuel for Automotive Vehicles as per IS 15490, being conducted by BIS at present. After lot inspections, the batches are released with a test certificate.

2. In this regard, it has now been decided that on the similar lines of LPG Cylinders, valves and Regulators, BIS would take support of BIS empanelled agencies for lot inspections of On-board CNG Cylinders as per IS 15490 also. Based on the reports of lot inspections submitted by them, BIS will be issuing the test certificates for applicable batches of Cylinders.

3. Standard operating Procedure (SOP) to be followed in this regard is attached for implementation. BIS Certification officer shall verify that all the requirements laid down in SOP have been complied with and the results of batches enclosed are conforming to the requirements of Indian Standard and issue the test certificates.

4. Technical auditor of the empanelled agency (TA) shall carry out lot inspection on behalf of BIS and submit the inspection report in the prescribed format as enclosed with the SOP. After the lot inspection, licensee will prepare the test certificate in the prescribed format and will submit that for verification by TA. BIS Certification officer shall examine the lot inspection report submitted along with the test certificate prepared by the licensee and based on the examination of the same and the conclusion that the lot is in conformity with the requirements of relevant Indian standards and SIT, shall issue the test certificate. Test certificates shall be issued by BIS Certification Officer latest by next day of the inspection.

5. Training of TAs:

(i) Classroom training for all TAs (both new as well as who are already engaged in lot inspections for other products) - One day training to be organized by BOs (Half Day classroom training and half day factory visit)

(ii) On job training of TAs:

a) **Induction of a new TA who has not undergone on job training for lot inspection of any product** - For the initial minimum 2 visits, the TA of empaneled agency will accompany BIS Officer during which the TA are expected to gain adequate on-job training and competency. After this, BIS Certification Officer will accompany TA for first visit during which inspection will be done by TA and observed by BIS Certification Officer to assess competency of the TA. Report of competency of TA should be submitted by BIS Officer to the Head (BO) with recommendation on the need of any further such inspection to be carried out in presence of BIS Certification Officer, in the prescribed proforma already circulated vide e mail dated 24 May 2022. Head (BO) may allocate more such inspections till the time TA is declared competent. It is to be noted that only lot inspection charges are to be levied from the licensee and no additional man-days charges are to be levied for such visits.

b) In case a TA has already been declared competent for LPG Cylinders as per IS 3196 (Part 1), then inspection can be assigned to the TA, however BIS Certification Officer shall accompany TA for first visit during which inspection will be done by TA and observed by BIS Certification Officer to assess competency of the TA for On-board CNG Cylinders as per IS 15490.

6. The bills raised by empanelled agency for lot inspections on monthly basis will be processed centrally by CSMD for each "accepted" lot inspections, as being done for other lot inspections of LPG Cylinders, valves and Regulators. Till the time requisite provision in manakonline is being made, CSMD shall process the bills based on verification from BOs. Head (BO) shall provide necessary support and information to CSMD in this regard.

7. This issues with the approval of DG.

(Rakesh Kumar)
Sc D

H(CMD-III)

DDG (Certification & CSM)

Circulated to : All ROs/BOs

Standard Operating Procedure (SoP) for

Lot Inspection of Seamless Steel Cylinders for On-Board Storage of Compressed Natural Gas as a Fuel for Automotive Vehicles as per IS 15490

Sl. No.	Activity	Responsibility
1.	**REQUEST FOR LOT INSPECTION**	
a)	• Request for Lot Inspection shall be made through Manakonline Portal preferably one week in advance or latest 4 days before the day of lot inspection. (*see the guidelines on Request, Planning of inspections and fee related matters attached as* ***Annexure- A***) • The request shall include lot-wise details of CNG Cylinders i.e Batch Number, Size (Quantity), Water Capacity, Serial Numbers etc. intended to be offered for inspection. • It is to be ensured that the offered batches have undergone all the activities including Heat Treatment, Hardness test, Hydrostatic Stretch Test, Tare Weight Measurement, Pneumatic Leakage Test, Ultrasonic examination etc. before the inspection. • Lot Inspection Charges shall be paid through Manakonline Portal. (*see the guidelines on Request, Planning of inspections and fee related matters attached as* ***Annexure- A*** *)*	Licensee
2.	**ALLOTMENT OF INSPECTION**	
a)	• Allotment of Lot Inspection to agency/BIS Certification Officer shall be made through Manakonline • Ensure rotation of agency and certification Officer • Monitoring to ensure that rotation among TAs is being followed by the agency to whom inspection has been assigned (*See* ***Annexure- A*** *attached for details*)	Head (BO)
b)	Assigning the lot inspection by agency in-charge to its TA ensuring rotation of TAs (*See* ***Annexure- A*** *attached for details*). It shall be ensured by the agency that inspecting officer is assigned by them on the same day or latest, by next day.	Agency in-charge

3.	**VERIFICATION OF BATCHES, SAMPLE SELECTION AND LOT INSPECTION**	
a)	• During the visit for Lot Inspection, ongoing activities at various stages shall be verified to ensure that all manufacturing and testing processes for the batches offered by the licensee have been completed. • The authenticity of the information provided by the Licensee regarding completion of various activities w.r.t the batches offered for lot inspection shall be ensured at the time of inspection. • Check and sign the inspection and testing records of various stages (Heat treatment, Hardness, Hydrostatic Stretch test, Tare weight, Pneumatic leakage etc.) for the batches taken up for lot inspection	CO /TA
b)	Ensure that the cylinders offered for lot inspection are stored/stacked batch wise without mix up (*see the guidelines on Request, Planning of inspections and fee related matters attached as **Annexure A**)*.	Licensee
c)	• Perform physical verification of the offered batches w.r.t the Batch Numbers, Size (Quantity), Water Capacity etc. • Mixing up of batches shall not be permitted. Verify whether the cylinders of different batches are stored as distinctly identifiable and not mixed up*).*	CO /TA
d)	• Identify the serial numbers of Cylinders for Acceptance Tests (A/T) and Cyclic Burst Test (B/T) **for next inspection**. • Verify the Serial Numbers of the cylinders selected for A/T and B/T, **as selected during previous inspection**.	CO /TA
e)	Selected serial nos. of the cylinders shall be entered in the sampling register and signed	Licensee CO/TA
f)	• Each of the test specimens prepared for A/T shall be properly marked/ identified with indelible permanent marker. • Proper marking/ identification of test specimens shall be verified.	Licensee CO /TA
g)	• While carrying out tensile test, it shall be ensured that the UTM has provision to plot graph. • In order to ensure proper correlation of graph with the test results, IO shall sign on the graph immediately after completion of tensile test along with Batch Number, Serial Number and Type of Test Specimen.	CO /TA
h)	***It is expected that minimum of 8 hours are spent in the factory by TA during the lot inspection***	**TA**

i)	• Record of photographs of B/T cylinder showing the serial number on the neck and the burst portion shall be maintained. • Preparation of the test results and uploading the testing records (of A/T & B/T of each cylinder) as per Sl. No. 6 of the format of lot inspection report) in manakonline. • Preparation of test certificate in prescribed format (*attached as **Annexure- C)***	Licensee
4.	**SUBMISSION OF LOT INPECTION REPORT**	
a)	• Verification of details in test certificate • Submit the inspection report along with the test certificate in the prescribed format during the lot inspection at the factory premises for consideration by BIS. *Lot inspection report shall be submitted in prescribed format (Format attached as **Annexure-B**)*	TA CO/ TA
b)	• All rejections (cylinders/shells/process rejections etc.) shall be deshaped fortnightly in the presence of CO/TA and entered in the deshaping record. • The deshaping records shall be duly signed.	Licensee Licensee/ CO/TA
c)	The inspection report is to be signed by licensee also and a copy of the same may be retained by the licensee	Licensee
5.	**ISSUANCE OF TEST CERTIFICATE BY BIS CERTIFICATION OFFICER**	
a)	Examination of the inspection report submitted by TA and Accept/Seek Clarification/Reject inspection report	CO
b)	Provide clarification to BIS Certification Officer, when any clarification is sought	TA
c)	Provide clarification to TA, if required	Licensee
d)	Issue test certificate (s)	CO
6.	**QUALITY ASSURANCE MEASURES**	
a)	It shall be ensured by Head (BO) that BIS Certification officer conducts lot inspection of every cylinder unit at least once in every 30 days or less; as decided by Head (BO) for adequate supervision	Head (BO)
b)	Head (BO) may also occasionally depute BIS officer on any day when lot inspection is being carried out to check the satisfactory operation of the system	

c)	Head (BO) should proactively interact with the management of licensee to have a periodic feedback on the TAs of the agencies	

Abbreviations: **CO**- BIS Certification officer
TA- Technical auditor of BIS empaneled agency

Annexure- A

Guidelines on Request, Planning of inspections, Sampling and fee related matters for lot inspection of Seamless Steel Cylinders for On-Board Storage of Compressed Natural Gas as a Fuel for Automotive Vehicles as per IS 15490: 2017

1. **Definition of batch and sampling plan**- As specified in IS 15490: 2017.
2. Licensees will submit the lot inspection request along with details of batches, preferably a week in advance or latest 4 days before the proposed day of lot inspection. Request from licensee for change in date of inspection with proper reason may be considered by Head (BO) by recording the justification.
3. For proper inspection/sampling, it should be ensured that licensee has got adequate storage/ stacking space within the factory premises so that Cylinders are offered batch-wise to the officer for inspection/ clearance. Mixing of batches shall not take place and each batch should be distinctly identifiable to facilitate its proper inspection & sampling.
4. Normally not more than two visits per licence may be planned every week. However, more visits may also be permitted by Head (BO) depending upon the need and availability of manpower. For lot inspections, licensee shall submit ₹ 10,000/- + GST per man day as special inspection charges. Licensee shall also make arrangement for travel and stay of the BIS Certification officer, as applicable. Otherwise, the payment towards travel and stay (for boarding and lodging per night stay) on actual basis shall be charged in addition to inspection charges (₹ 10,000/-) as specified in Scheme - I of BIS (Conformity Assessment) Regulations. All these charges are over & above the marking fees. However, for visits paid by TA of empanelled agency, travel and stay expenses are not to be paid by the licensee.
5. Preparation of schedule and allocation of visits for lot inspections- Monthly schedule shall be prepared by Head (BO) and Inspection agency/ BIS Certifying Officer shall be assigned for each visit requested by the licensee. BIS Certification officer shall issue the test certificate based on the examination of lot inspection report submitted along with the test certificate by TA. In addition to adherence to principle of rotation given below, Head BOs shall rotate the visits for consequent production week equally amongst all the available certification officers (or agents, if applicable) in the Branch as far as possible in line with guidelines circulated vide CMD-I/2:12:6 dated 25 Jan 2021:

   a. Rotation of BIS Certification officer issuing test certificate to be ensured.

   b. Multiple visits to a single licensee are rotated amongst all the available certification officers/Technical Auditors of agencies equitably as far as possible.

   c. No particular certification officer/Technical Auditors of agencies is allocated unusually large number of visits in respect to a specific licensee.
6. In case a manufacturer has licences for more than one product at the same premises and quantum of work is less on the day of visit, the remaining period may be utilized by the officer for lot inspection of other licence(s) held by the licensee against one man-day charge already paid by the licensee to BIS.

Annexure- B

FORMAT FOR LOT INSPECTION OF Seamless Steel Cylinders for On-Board Storage of Compressed Natural Gas as a Fuel for Automotive Vehicles as per IS 15490: 2017

1) Name of the Unit:-
2) License Number:-
3) Date of Lot Inspection:-
4) Batch Number:-
5) Description of cylinders, batch wise:

6) Inspection & Testing prior to the release of Batch

Sr. No.	Tests	Clause reference of IS 15490	Number of samples	Observation
1.	Water Capacity	11.5		Satisfactory/ Not Satisfactory
2.	Minimum measured thickness	6		Satisfactory/ Not Satisfactory
3.	Mass empty	Annex F		Satisfactory/ Not Satisfactory
4.	Hydrostatic Stretch Test *(Test Pressure BAR)	11.2		Satisfactory/ Not Satisfactory
5.	Air Leakage Test* (Test Pressure ( ) BAR	11.4		Satisfactory/ Not Satisfactory
6.	Hardness Test*	11.1		Satisfactory/ Not Satisfactory
7.	Acceptance tests (Mechanical tests)	10.1		Satisfactory/ Not Satisfactory • Y.S.: Min/Max • T.S.: Min/Max • % Elongation: Min/Max

				• Impact strength (Individual and average): Min/Max • Bend test:
8.	Marking	13		Satisfactory/ Not Satisfactory
9.	Ultrasonic test*	11.3		Satisfactory/ Not Satisfactory
10	Pressure Cyclic and Burst test	10.2		Satisfactory/ Not Satisfactory
11	Colour Identification	15	*one from each batch*	Satisfactory/ Not Satisfactory

*Verification of compliance to be done from manufacturers' test record for batches offered. Also, checking on random cylinders for cylinders under production to be done during visit.

Remark, any other information*:*

1. Batch – Accepted / Not Accepted
2. Test Certificate – EnclosedDeviations

if any:

Signature of QCI-
Name-
Date-

Signature of CO/TA-
Name & Designation -
Date-

Annexure- C

ACCEPTANCE CERTIFICATE

Acceptance certificate for seamless steel cylinders No……

A consignment of ……..… cylinders consisting of …….…. test batches have been inspected and tested ……..according to IS 15490.

Designation or type of gas Sl No. of Cylinders Qty.

Manufacturer's Nos. : ……... to …….…….

Owner's Nos.[1]) : …….. to …….……

Manufacturer : ……..... Manufacturer order No.:……..…….....

Address : ……

Country : ……..... Date : ……..…

Owner/Customer [2]) : …… Purchase Order No. : …….……...

TECHNICAL DATA

Water capacity, V : Nominal [1]) ……..... litre
Minimum[1]) ……..... litre

Test pressure, P_h : ……...……bar

Working pressure [1]) at 15 ^oC, P_w : ……..… bar

Maximum filling charge [1]) : ……..... kg

Nominal length : ……. mm
(without cap and without valve)

Outside diameter, D_o : ……... mm

Minimum wall thickness, a : …….. mm

Drawing No. : …….

Material :

Specified analysis [3]) : C S Mn P S Cr Mo Ni

Percent, *Max* :

Percent, *Min* :

Heat treatment :

Stamp-markings [3]) :

……

Date

……. …….

Manufacturer's representative BIS Certification Officer

ACCEPTANCE TESTS

1. Measurement taken on one representative cylinder of the batch [4)]

Test No.or Batch No. or Cylinder No.	Covering Serial No. ……to …….	Water Capacity,	Mass Empty, Kg	Minimum Measured Thickness, mm		Outside Diameter
				Wall	Base	

2. Mechanical Tests [4)]

Test No.	Cast No.	Tensile Test			Hardness, HB	Impact Test Charpy (V).. Direction-		Bend Test
		Yield Stress, MPa	Tensile Strength, Mpa	Elongation (A) %		Average, J/cm^2	Minimum, J/cm^2	180 ° Without Cracking

3. Pressure Cyclic & Burst Test

Cylinder Sr. No filled with non -corrosive oil & subjected to Pressure Cycling Test between … bar and … bar. Cylinder satisfactorily completed 40,000 cycles (Specified Minimum 40,000 Cycles) without developing a leak After completion of the Pressure Cyclic Test, the same cylinder is subjected to Burst Test.

Batch no.	Cylinder no.	Burst Pressure	Remarks

This is to certify that the cylinders covered by this Acceptance Certificate have passed the hydraulic pressure test and all the other tests as required in **11** of IS 15490 and they are in accordance with this standard.

Special remarks:

1) Delete as applicable.
2) If required by customer.
3) To be quoted or drawing to be attached.
4) Need not be filled in if test reports are attached

Signature with date
Name and designation of Firm's representative

Signature with date
Name and designation of BIS Certification Officer