केन्द्रीय मुहर विभाग - III

हमारा संदर्भ- **केन्द्रीय मुहर विभाग-3/16: IS 7312** **दिनांक :18 10 2018**

विषय: अनुपालन हेतु एस आई टी

सभी शाखा कार्यालय से आग्रह है कि एस आई टी का अनुपालन तत्काल प्रभाव से 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 7312** **Date: 18 10 2018**

Subject: SIT for IS 7312:2018 – Welded and Seamless Steel Dissolved Acetylene Gas Cylinder

This has reference to the subject mentioned above.

BOs may kindly ensure implementation of the SIT with immediate effect.

Amit Kumar
Sc. C (CMD III)

Head (CMD - III)

Circulated to: All ROs/BOs

Copy to: ITS for hosting on Intranet

SCHEME OF INSPECTION AND TESTING FOR CERTIFICATION OF WELDED AND SEAMLESS STEEL DISSOLVED ACETYLENE GAS CYLINDER ACCORDING TO IS 7312 : 2018

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. LABELLING AND MARKING – As per the requirements of IS 7312 : 2018.

4. 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.

4.1 All the production which conforms to the Indian Standard and covered by the licence should be marked with Standard Mark.

5. 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, 20016.

Table 1 ……

TABLE 1

(1) Test Details				(2) Test Equipment Requirement	(3) Levels of Control		
Cl.	Requirement	Test Methods		**R:** required (or) **S:** Sub-contracting permitted	No. of Sample	Frequency	Remarks
		Clause	Reference				
4	**MATERIAL**						
4.1	Steel	4.1,6.3	IS 7312	S	One	Each Heat	_
4.2	Bung/Valve pad	4.2	IS 7312	S	Two	Each Consignment	No further testing is required, if accompanied with test certificate or ISI marked.
4.3	Foot-rings	4.3	IS 7312	S	One		
7	Welding	7.1 to 7.5	IS 7312	R	Each Cylinder	_	_
8	Manufacture	8	IS 7312	R	Each Cylinder	_	_
9	Valves and Valves Pad	9	IS 7312	R	Each Valve and Valve Pad	_	_

10	Foot- ring	10.1	IS 7312	R	Each Foot- ring	_	_
	Safety Device	10.2	IS 7312	S	As given in Annex I of SIT		No further testing is required, if accompanied with test certificate or ISI marked
11	Heat Treatment	11	IS 7312	R	Each Cylinder	_	_
12	Inspection	12.1.3	IS 7312	R			
13	Radiographic Examination	13	IS 7312	R	One Cylinder	As per *clause* **13.2** of IS 7312	_
14	Checking of Water Capacity	14	IS 7312	R	Each Cylinder	_	_
15	Hydrostatic Tests	15.1 , 15.2	IS 7312	R			
16	Pneumatic Leakage Test	16	IS 7312	R			
17	Burst Test	17	IS 7312	R	One Cylinder	Every Batch# of 403.	_
18	Acceptance Tests	18	IS 7312	R	One Cylinder	Every Batch# of 202 or less.	_

19	**TECHNICAL REQUIREMENTS FOR ACETYLENE, POROUS FILLING MASS AND SOLVENT**						
19.1	Acetylene	19.1, Annex D	IS 7312	R	Each Cylinder	_	
19.2	*Porous Material*					_	
	Gap between cylinder shell and porous material	19.2.3	IS 7312	R	Each Cylinder	_	
	Porosity	19.2.4 Annex B	IS 7312	R	One Cylinder	Every Batch# of 202 or less.	
	Crushing Strength	19.2.5 Annex B	IS 7312	R	One Cylinder	Every Batch# of 202 or less.	_
19.3	Solvent and Acetylene Contents	19.3	IS 7312	R	Each Consignment	_	
	Filling of Acetone in cylinder	19.3.2	IS 7312	R	Each Cylinder	_	

20.2	**PROCEDURE FOR TYPE APPROVAL OF DISSOLVED ACETYLENE CYLINDERS**					
	Test of the Integrity of porous material	7.6, Annex E	IS 7312	R	As per *clause* **20.2.4** of IS 7312	Each new design of cylinder as per details given in *clause* **20.1** of IS 7312 shall be subjected to prototype testing. Any change in design shall also require the prototype testing in accordance with *clause* **20** of IS 7312. If a cylinder fails, retesting may be permitted as per *clause* **20.7** of IS 7312.
	Porosity	Annex B	IS 7312			
	Crushing Strength	Annex C	IS 7312			
	Elevated Temperature Test	20.3	IS 7312			
	Vibration Test	20.4	IS 7312			
	Backfire Test	20.5	IS 7312			
	Bonfire Test	20.6	IS 7312			

Cylinders of identical type and design heat treated during one continous running in the same manner and under similar conditions and constructed from steel of similar analysis and made by the same steel manufacturer.

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.

ANNEX – I

LEVEL OF CONTROL OF SAFETY DEVICE(FUSIBLE PLUG) AS PER IS 13497:2017

(1)				(2)	(3)		
Test Details				**Test Equipment Requirement**	**Levels of Control**		
Clause	**Requirement**	**Test Methods**		**R: required (or) S: Sub-contracting permitted**	**No. of Sample**	**Frequency**	**Remarks**
		Clause	Reference				
3	Materials (of Body)	3	IS 13497	S	One	Each Consignment	a) For testing of physical properties of Raw Material a test piece shall also be required with each consignment. b) No further testing is required, if accompanied with test certificate.
4	Screw Thread of the Fusible Plug	4	IS 13497	S	5 % of total quantity		In case of failure, entire consignment shall be checked and only those plugs that are conforming, shall be used.
6	Flow Capacity of Fusible Plug	6	IS 13497	S	Three		This is a type test which may carried out in independent laboratory for the type and design.

7	Test for Fusible Alloy	7 7.3.1	IS 13497 IS 5903	S	One	Each Consignment	–
8	Extrusion and Yield Temperature of Fusible Plug	8	IS 7312	S	One	Each Consignemnt	
9	Pneumatic Test	9	IS 7312	R	Each Fusible Plug	–	
10	Fixing of Fusible Plug	10	IS 7312	R			
11	Markings	11	IS 7312	-			

ANNEXURE – 'A'

STAGE INSPECTION FOR MANUFACURE OF DISSOLVED ACETYLENE GAS CYLINDERS

1. Material – a) Check test for physical and chemical properties for each heat.

b) Check for dimensions and surface defects (visual).

2. Manufacture of components

Body	Bung	Foot Ring	Cap and Handle
a) Shell and dished ends Check pressing for thickness and surface defects such as cracks and laminations.	a) Check blanks, forging for cracks and other surface defects.	a) Check for dimensions and other defects.	a) Check for surface defects.
b) Random check of height to maintain water capacity.	b) After manufacturing check dimensions and threading by gauges.	b) Random check for data stamped.	b) Check threads with gauges.

a) Check shell, top & bottom dished ends.
b) Inspect welding defects of the body, bungs & foot ring.
c) Check for permanent volumetric expansion as per clause 8.1.
d) Check for defects after hydraulic test for leakage.
e) Select cylinders for acceptance and burst test.
f) Check bung threads, leakage between valve and bung and leakage of the cylinder (pneumatically).
g) Check all cylinders for water capacity.
h) Check for internal cleaning and drying.
i) Check for weight of each empty cylinder with fusible plugs, neck-ring and foot-ring.
j) Inspection of porous mass for gap.
k) Weight of completed cylinder, which is weight of item (i) plus weight of porous filling but not including valve or cap.
l) Check for weight in item (k) plus weight of porous filling, solvent at atmospheric pressure and valve but not including valve cover, if any.
m) Check and note the percentage porosity of filling material.
n) Inspect fitting of cap on cylinders and details stamped on the cylinder.
o) **Final visual inspection after painting**.

ANNEX 'B'
GAS CYLINDER CERTIFICATE

Manufacturer: Certificate No……
Date……..

Purchaser: ……
Order No.: ……
Batch No.: ……
Cylinder Description ……liter water capacity. Three piece welded Cylinder working pressure …… kgf./cm^2

This is to certify that the cylinders manufactured, inspected and tested as mentioned below during the period from …… to …….. at M/s ……
meet the requirements of Specification IS 7312: 2018, Drawing No.……

The Cylinders have been fitted with valves bearing ISI Mark conforming to IS 3224.

METHOD OF MANUFACTURE 1. Welding Process: …….. 2. Method of Support: …… 3. Heat Treatment ……. **INSPECTION :** 4. Shells & dished End. OK 5. Bung & Bung Welding OK 6. Foot ring welding & Marking OK 7. Internal examination before closing-in-operation. OK 8. i) Circumferential & Longitudinal welding OK ii) Serial No. Stamping. OK	**9. Check for:** i. X-Ray Examinations for Longitudinal and Circumferential welds (Sample X-Ray) OK ii. Liquid Penetration Examination of Bung welding OK iii. Bung threads OK iv. Cap Threads OK Leakage with valve fitted; No leakage to cylinder OK 10. Porous Mass OK 11. Valve Caps OK 12. Finishing & Painting OK **TESTS:** 13. Hydrostatic stretch test at ……kgf/cm^2 (Ref : Annex – B-3) 14. Hydraulic Pressure test at …….. kgf/cm^2 15. Leakage test at …….. kgf/cm^2 (using air) 16. Acceptance test : Report No…….dt……. (Ref. Annex B-1) 17. Bursting test: i. Cylinder No……. ii. Burst Pressure……. kgf/cm^2 iii. Nominal hoop stress…… kgf/cm^2 iv. Cylinder bursted without fragmentation : Yes 18. Max. Gas capacity : ……kg of ……purity 19. Porous Mass filling Annex B2 20. Crushing strength test

QUANTITY PASSED: CYLINDERS PASSED ----------NOS
Tested/Rejected:…….. Cylinders Nos (Ref Annexure B4):

Cast No. of Steel …… i. Tensile……. kgf/mm^2 ii. Yield…… kgf/mm^2 iii. Elongation……..% Steel used IS……..Gr…….... C% Si% Mn% S% P%	Cast No. of Steel …… i. Tensile……. kgf/mm^2 ii. Yield…… kgf/mm^2 iii. Elongation……..% Steel used IS……..Gr…….... C% Si% Mn% S% P%

Representative of Licensee Inspecting Officer (BIS)

ANNEXURE – B-1

Tested Cylinder Nos: …… Certificate No……
Batch No.: …… Date……..
Cylinder Nos
Tested at.: ……

Particulars	**Longitudinal Parent Metal**	**Dished End Parent Metal**	**Longitudinal Weld**	**Circumferential Weld**
Sample No.				
Width x Thickness (mm)				
Area of C.S (mm^2)				
Gauge Length (mm)				
Yield load (kgf)				
Yield Stress ($kgf/mm^{2)}$				
Tensile load (kgf)				
Tensile Stress ($kgf/mm^{2)}$				
Extended Length (mm)				
% Elongation				
Position of Fracture				

Bend Test :
a) Root OK
b) Face OK
c) Shell Material OK
d) Dished End Material OK

Macro Examination :
a) Neck OK
b) Body OK

Minimum Thickness Test (on dished end): … mm

Representative of Licensee Inspecting Officer (BIS)

Certificate No :……..
Date : ……

ANNEXURE – B-2
DETAILS OF POROUS FILLING MASS

Each cylinder has been filled with porous filling material approved by Statutory Authority.

POROSITY & GAP TESTS

Cylinder Sl. No. Tested :
Porosity :
Gap :

Each cylinder has been filled with two ……Fusible Plugs conforming to IS 13497

Drawing No. :
Maximum Gas filling capacity:

Representative of Licensee Inspecting Officer (BIS)

Certificate No. …….
Date……

ANNEXURE – B3

RECORD OF HYDROSTATIC STRETCH TESTS, VOLUME, CAPACITY ETC

Tare Weight Shell wt ( ) + Filler wt ( ) +Acetone wt ( ) + Saturated Gas ( ) + Valve ( )

Cyl. Sl. No.	Permanent Exp %	Shell Wt (kg)	Vol. Cap (lit.)	Filler Mat. Wt (kg)	Tare Wt (kg)	Remarks

Representative of Licensee

Inspecting Officer (BIS)

ANNEXURE B-4
Name and address of Licensee

DETAILS OF REJECTION/TESTING

Batch No.: …… Certificate No……
Cylinder No. : Tested/Rejected Cylinders Date……..

Acceptance Test	Burst Test	Porosity Test	Hydrostatic Stretch Test	Air Leakage Test

Welding Defects	Crushing Strength of porous mass	Gap in porous mass	Others

Total tested/rejected cylinders…….Nos. as detailed above

Representative of Licensee Inspecting Officer (BIS)