



**Industry & Facilities Division
Third Party Inspection Report**

INSPECTION REPORT Nr: INS/ZW-19/220-01		Revision Nr 1
<input type="checkbox"/> Initial <input type="checkbox"/> Interim <input type="checkbox"/> Final <input type="checkbox"/> Resident		
Inspection requested by: Chuzhou Dingxing Electronic Technology Co., Ltd		
Inspection performed as Recognised Authority:		<input type="checkbox"/> Yes, :(Recognition) <input checked="" type="checkbox"/> No
BV Job Nr: INS/ZW-19/220		

Project: Third Party Inspection For CNG-1 Gas Cylinders for Vehicle	IPO Ref (If applicable): N/A (BV internal P/o)
BV Client: Chuzhou Dingxing Electronic Technology Co., Ltd	P/o nr: INS/ZW-19/220 (client to BV)
Manufacturer/Vendor: Zhejiang Tianen Pressure Manufacturing Co.,Ltd	P/o nr: N/A (client to Manufacturer)
Sub-Vendor (If applicable): N/A	
Inspection Location: Hairun Street , Chanao village, Sanmen County, Taizhou City, Zhejiang Province, China	Previous Inspection (If applicable): N/A
Inspection performed on: Dec. 19 th -20 th , 2019 (Date(s))	Next Inspection (If applicable): N/A

MATERIAL / SUBJECT OF INSPECTION <input type="checkbox"/> Refer to attachment section J instead (Indicate if separate material list is provided in attachment)	ITEM / TAG Nr	QTY As per P/O	QTY Offered for inspection
CNG-1 Gas Cylinders for Vehicle (details for annex cylinders list) 65L	/	540PCS	540PCS
CNG-1 Gas Cylinders for Vehicle (details for annex cylinders list) 120L	/	120PCS	120PCS

A – INSPECTION RESULT		
<input checked="" type="checkbox"/> Satisfactory (Without comments)	<input type="checkbox"/> Satisfactory with comments (Any of trailing Punch or Non Conformity items is still open)	<input type="checkbox"/> Not Satisfactory (NCR raised during the inspection)
Inspection Summary: (for details refer to section E)		
<p>The third party inspection for CNG Cylinders for Vehicle was performed by Mr. Xiang Jianhua from Bureau Veritas Quality Service (Shanghai) Co., Ltd, the inspection result as followings:</p> <p>1. Visual inspection and dimensional inspection at randomly 1%;</p> <p>2. Witness of mechanical property test and bursting test;</p> <p>3. Document review;</p> <p>The result was satisfactory.</p>		
Open Non Conformities:	<input type="checkbox"/> Yes, details in section G	<input checked="" type="checkbox"/> No
Open Punch List Items:	<input type="checkbox"/> Yes, details in section H	<input checked="" type="checkbox"/> No
Release Note Issued:	<input type="checkbox"/> Yes, number(s): (Release Note number)	<input checked="" type="checkbox"/> No
BV Stamping:	<input type="checkbox"/> Yes,	<input checked="" type="checkbox"/> No

On behalf of Bureau Veritas BV Inspector: Xiang Jianhua <i>Xiang Jianhua</i> (Name and Signature)	On behalf of Bureau Veritas BV Coordinator: Xingxing Wang <i>Victor Wang</i> (Name and Signature)
BV Office: BVQS	Inspection Report Date: Dec 20th, 2019
Distribution: <input checked="" type="checkbox"/> CLIENT <input checked="" type="checkbox"/> BV <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER:	Attachments Report: <input checked="" type="checkbox"/> Yes, details in section J <input type="checkbox"/> No



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B - REFERENCE DOCUMENTATION:					
<input type="checkbox"/> Refer to attachment section J instead (Indicate if separate document list is provided in attachment)					
Title	Reference n°	Rev.	Approval status	Approved by	Date
Gas cylinder –Refillable seamless steel gas cylinders-Design, construction and testing Part1:Quenched and tempered steel cylinders with tensile strength less than 1100MPa	ISO 9809-1		Approved	ISO	2010
Gas cylinders-High pressure cylinders for the on board storage of natural gas as a fuel for automotive vehicles	ISO 11439	/	Approved	ISO	2013
Drawing	TE09-06	0	As final	BV	2010-01-08

C – ATTENDEES		
Name	Position	Representing
Mr. Xiang jianhua	Inspector	BV
Mr. Zhao	Director	Zhejiang Tianen
Mr.Xu	Inspector	Zhejiang Tianen

D - MEASURING & TESTING EQUIPMENT USED			
<input type="checkbox"/> Refer to attachment section J instead (Indicate if separate equipment list is provided in attachment)			
Equipment Type	Equipment Identity n°	Last Calibration Date	Expiry Date
Burst test equipment	17060632	2019.09.30	2020.09.29
Pressure gauge	Z01908	2019.09.28	2020.03.27
Impact machine	LS201101161	2019.03.29	2020.03.28
Steel tape	DL9005	2019.03.29	2020.03.28
Hydraulic universal testing machine	LS201401160	2019.03.29	2020.03.28
Vernier caliper	2-730101044	2019.03.29	2020.03.28

E - INSPECTION DETAILS
<p>Description of the inspections carried out:</p> <p>The third Party Inspection for CNG Cylinders for Vehicle was carried out by undersigned inspector Mr. Xiang Jianhua from Bureau Veritas Shanghai on Dec. 19th , 2019 at Zhejiang Tianen Pressure Manufacturing Co., Ltd.</p> <ul style="list-style-type: none"> ➤ Manufacturing Progress Status <p>When BV inspector arrives the manufacturer on Dec. 19th, 2019, the cylinders were finished and ready for inspect, the samples were ready for test.</p> ➤ Details of inspection activities carried out with reference to ITP (Each activity elaborated in detail) <ol style="list-style-type: none"> 1. Visual inspection and dimensional inspection at randomly 1%; <p>BV inspector inspected the surface quality, marking content and dimensional of the cylinders, and the</p>



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inspection results were in line with the requirements of customers and relevant standards, and the results were acceptable.

a. Visual check

BV inspector performed the visual inspection of cylinders appearance, no obvious defects (such as: impurity spots, exposed bottom, obvious uneven coating thickness, tears, pits etc.) were found during visual inspection, the result was acceptable.

b. Marking check

The marking method adopts steel seal ,the contents marked on the top of the cylinder are as follows:

Example: MADE IN CHINA TE 65L 12/2019 USD ONLY TF APPROVD PRD CNG-1 UT
CNG ONLY DONOT USED AFTER 11/2039 200BAR/15°C ISO11439-2013 D19011201

The marking meet the client requirement.

c. Dimensional check

BV inspector measured the outer diameter and length of the cylinders, the result is in accordance with the customer’s requirements. Details see follows table-1.

Table-1.

S/N:	outer diameter	length
65L	Unit mm	Unit mm
	356±3.56	880±10
D19010038	357	877
D19008415	358	873
D19010021	357	880
D19008005	357	875
D19010039	357	873
D19009193	358	873
120L	356±3.56	1440±10
D19011118	357	1435
D19011034	357	1437

2. Witness of mechanical property test and bursting test;

When the BV inspector arrives at the manufacturer on Dec.19th, 2019, the samples have been sampled and processed ready for testing.

a. Witness of mechanical property test

The mechanical property test was carried out by manufacturer 1PCS per furnace No., the mechanical property test result meet to the drawing TE09-06, the details were listed in the following Table-2:

Table-2 mechanical property test result

Size	Furnace No	Lot No.	Cylinder Material	mechanical property						
				Rm/MPa	Rel/MPa	A/%	Akv/J/-50°C		Average	
				970-1100MPa	≥870MPa	≥14	27J			
65L	19058	D19008	34CrMo4	1042	963	15	62	78	77	72.3
120L	19059	D19011	34CrMo4	1005	923	16	78	72	66	72

The bending test adopts Ø 28.0 bending core. After bending to 180 degrees, no visible cracks are found on the surface through visual inspection, meeting the requirements.



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b. Witness burst test

The gas cylinder burst test was performed by manufacturer 1PCS per lot No. according to the drawing TE09-06, the test result meet to the drawing's requirement, details test result as following **Table-3**:

Table-3

SIZE	S/N	Burst Test/Bar	Fracture Surface
/	/	≥480 Bar	/
65L	D19009201	567.6	Ductile fracture
65L	D19008201	551.1	Ductile fracture
65L	D19010201	543.2	Ductile fracture
120L	D19011201	568.2	Ductile fracture

3. Document review

The relative documents were submitted by manufacturer for BV inspector reviewing, the result met the client's requirements, the document as followings:

- 1.Product quality certificate.
- 2.Hydraulic bursting test report
- 3.Batch cylinder series number.
- 4.Mechanical property test report.
- 5.Ultrasonic inspection report.
- 6.Hardness test report
- 7.Dimensional inspection report.
- 8.Airtight seal test report.
- 9.Chemical composition report.

The details refer to attached documents.

➤ **Confirmation of Certificates review** (including endorsed test certificates and validity of operators certificates as per scope of work)

The calibration certificate of the instruments and measuring tool used for the inspection were in validated periods.

➤ **Results of Inspection steps**

No.	BV Scope of Work	Satisfactory	Unsatisfactory	Findings
1	Visual inspection and dimensional inspection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	/
2	Witness of mechanical property test and bursting test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	/
3	Document review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	/

The inspection result was satisfactory

➤ **Problems pending / Areas of Concern**

N/A



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F – HEALTH, SAFETY & ENVIRONMENT COMMENTS <i>(Comment on Observations and Actions Taken During the Inspection)</i>
<p>1) The inspection was conducted observing the proper HSE rules.</p> <p>2) The inspector and the personnel used the proper personal safety equipment during the test/shop visit respected National rules about safety.</p> <p>3) Factory performed all the proper safety checks and is using the proper safety equipment.</p> <p>4) No deviation or accident to be reported during the visit; No QHSE issues to be report</p>

G- NON CONFORMITIES							
<input type="checkbox"/> Refer to attachment section J instead <i>(Indicate if separate punch list is provided in attachment)</i>							
Item	Description	Status	Raised on	Report Nr.	Closed on	Report Nr.	Comments
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

H – PUNCH LIST ITEMS							
<input type="checkbox"/> Refer to attachment section J instead <i>(Indicate if separate punch list is provided in attachment)</i>							
Item	Description	Status	Raised on	Report Nr.	Closed on	Report Nr.	Comments
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

I - DIGITAL PICTURES	
	
Pic 1. Waiting for checking	Pic 2. Waiting for checking



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Pic 3. Visual Check



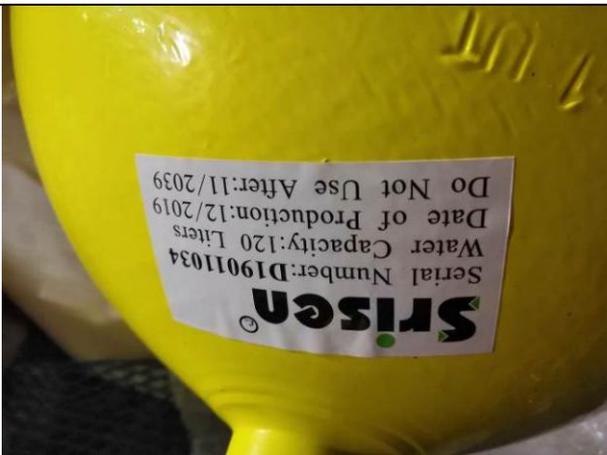
Pic 4. Visual Check



Pic 5. Visual Check



Pic 6. Marking Check



Pic 7. Marking Check



Pic 8. Dimension Check



Pic 9. Dimension Check



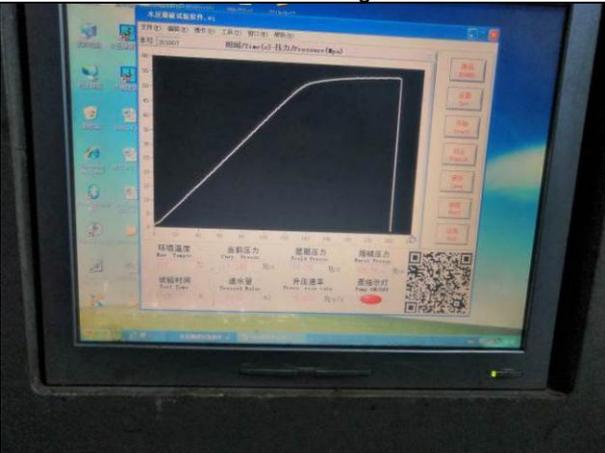
Pic 10. Prepare for Burst test



Pic 11. Bursting test



Pic 12. Bursting test



Pic 13. Bursting test



Pic 14. Bursting test



Pic 15. Bursting test



Pic 16. After Bursting test



Pic 17. Prepare for mechanical property test



Pic 18. Prepare for mechanical property test



Pic 19. Mechanical property test



Pic 20. Mechanical property test

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Pic 21. Mechanical property test



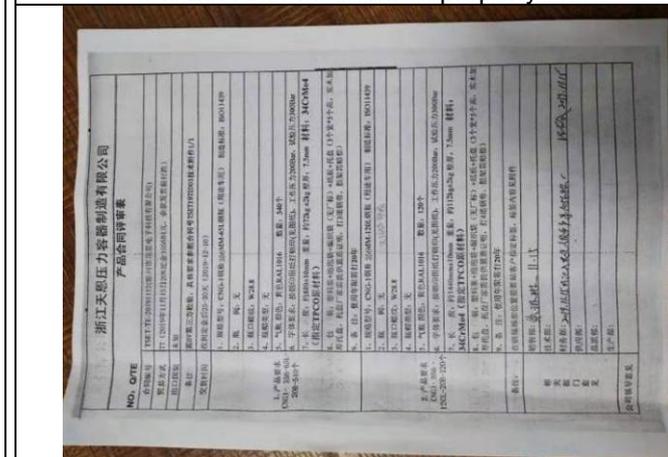
Pic 22. Mechanical property test



Pic 23. After Mechanical property test



Pic 24. After Mechanical property test



Pic 25. Customer contract requirements



Pic 26. Calibration Documents review

J – ATTACHMENTS			
Item	Attachment Name	Total Pages	Description



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01	ATT-01-Documents reviewed	11	Documents reviewed
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END OF REPORT

BATCH CYLINDER SERIES NUMBER
Batch No.: D19008, D19009, D19010, D19011

CNG1-356-65L-200BAR D19008:200PCS.			
NO.	NO.	NO.	NO.
D19008001	D19008051	D19008101	D19008151
D19008002	D19008052	D19008102	D19008152
D19008003	D19008053	D19008103	D19008153
D19008004	D19008054	D19008104	D19008154
D19008005	D19008055	D19008105	D19008155
D19008006	D19008056	D19008106	D19008156
D19008007	D19008057	D19008107	D19008157
D19008008	D19008058	D19008108	D19008158
D19008009	D19008059	D19008109	D19008159
D19008010	D19008060	D19008110	D19008160
D19008011	D19008061	D19008111	D19008161
D19008012	D19008062	D19008112	D19008162
D19008013	D19008063	D19008113	D19008163
D19008014	D19008064	D19008114	D19008164
D19008015	D19008065	D19008115	D19008165
D19008016	D19008066	D19008116	D19008166
D19008017	D19008067	D19008117	D19008167
D19008018	D19008068	D19008118	D19008168
D19008019	D19008069	D19008119	D19008169
D19008020	D19008070	D19008120	D19008170
D19008021	D19008071	D19008121	D19008171
D19008022	D19008072	D19008122	D19008172
D19008023	D19008073	D19008123	D19008173
D19008024	D19008074	D19008124	D19008174
D19008025	D19008075	D19008125	D19008175
D19008026	D19008076	D19008126	D19008176
D19008027	D19008077	D19008127	D19008177
D19008028	D19008078	D19008128	D19008178



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D19008029	D19008079	D19008129	D19008179
D19008030	D19008080	D19008130	D19008180
D19008031	D19008081	D19008131	D19008181
D19008032	D19008082	D19008132	D19008182
D19008033	D19008083	D19008133	D19008183
D19008034	D19008084	D19008134	D19008184
D19008035	D19008085	D19008135	D19008185
D19008036	D19008086	D19008136	D19008186
D19008037	D19008087	D19008137	D19008187
D19008038	D19008088	D19008138	D19008188
D19008039	D19008089	D19008139	D19008189
D19008040	D19008090	D19008140	D19008190
D19008041	D19008091	D19008141	D19008191
D19008042	D19008092	D19008142	D19008192
D19008043	D19008093	D19008143	D19008193
D19008044	D19008094	D19008144	D19008194
D19008045	D19008095	D19008145	D19008195
D19008046	D19008096	D19008146	D19008196
D19008047	D19008097	D19008147	D19008197
D19008048	D19008098	D19008148	D19008198
D19008049	D19008099	D19008149	D19008199
D19008050	D19008100	D19008150	D19008200

CNG1-356-65L-200BAR D19009:200PCS			
NO.	NO.	NO.	NO.
D19009001	D19009051	D19009101	D19009151
D19009002	D19009052	D19009102	D19009152
D19009003	D19009053	D19009103	D19009153
D19009004	D19009054	D19009104	D19009154
D19009005	D19009055	D19009105	D19009155
D19009006	D19009056	D19009106	D19009156
D19009007	D19009057	D19009107	D19009157
D19009008	D19009058	D19009108	D19009158
D19009009	D19009059	D19009109	D19009159
D19009010	D19009060	D19009110	D19009160
D19009011	D19009061	D19009111	D19009161



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D19009012	D19009062	D19009112	D19009162
D19009013	D19009063	D19009113	D19009163
D19009014	D19009064	D19009114	D19009164
D19009015	D19009065	D19009115	D19009165
D19009016	D19009066	D19009116	D19009166
D19009017	D19009067	D19009117	D19009167
D19009018	D19009068	D19009118	D19009168
D19009019	D19009069	D19009119	D19009169
D19009020	D19009070	D19009120	D19009170
D19009021	D19009071	D19009121	D19009171
D19009022	D19009072	D19009122	D19009172
D19009023	D19009073	D19009123	D19009173
D19009024	D19009074	D19009124	D19009174
D19009025	D19009075	D19009125	D19009175
D19009026	D19009076	D19009126	D19009176
D19009027	D19009077	D19009127	D19009177
D19009028	D19009078	D19009128	D19009178
D19009029	D19009079	D19009129	D19009179
D19009030	D19009080	D19009130	D19009180
D19009031	D19009081	D19009131	D19009181
D19009032	D19009082	D19009132	D19009182
D19009033	D19009083	D19009133	D19009183
D19009034	D19009084	D19009134	D19009184
D19009035	D19009085	D19009135	D19009185
D19009036	D19009086	D19009136	D19009186
D19009037	D19009087	D19009137	D19009187
D19009038	D19009088	D19009138	D19009188
D19009039	D19009089	D19009139	D19009189
D19009040	D19009090	D19009140	D19009190
D19009041	D19009091	D19009141	D19009191
D19009042	D19009092	D19009142	D19009192
D19009043	D19009093	D19009143	D19009193
D19009044	D19009094	D19009144	D19009194
D19009045	D19009095	D19009145	D19009195
D19009046	D19009096	D19009146	D19009196
D19009047	D19009097	D19009147	D19009197
D19009048	D19009098	D19009148	D19009198



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D19009049	D19009099	D19009149	D19009199
D19009050	D19009100	D19009150	D19009200

CNG1-356-65L-200BAR D19010:140PCS.			
NO.	NO.	NO.	NO.
D19010001	D19010051	D19010101	
D19010002	D19010052	D19010102	
D19010003	D19010053	D19010103	
D19010004	D19010054	D19010104	
D19010005	D19010055	D19010105	
D19010006	D19010056	D19010106	
D19010007	D19010057	D19010107	
D19010008	D19010058	D19010108	
D19010009	D19010059	D19010109	
D19010010	D19010060	D19010110	
D19010011	D19010061	D19010111	
D19010012	D19010062	D19010112	
D19010013	D19010063	D19010113	
D19010014	D19010064	D19010114	
D19010015	D19010065	D19010115	
D19010016	D19010066	D19010116	
D19010017	D19010067	D19010117	
D19010018	D19010068	D19010118	
D19010019	D19010069	D19010119	
D19010020	D19010070	D19010120	
D19010021	D19010071	D19010121	
D19010022	D19010072	D19010122	
D19010023	D19010073	D19010123	
D19010024	D19010074	D19010124	
D19010025	D19010075	D19010125	
D19010026	D19010076	D19010126	
D19010027	D19010077	D19010127	



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D19010028	D19010078	D19010128	
D19010029	D19010079	D19010129	
D19010030	D19010080	D19010130	
D19010031	D19010081	D19010131	
D19010032	D19010082	D19010132	
D19010033	D19010083	D19010133	
D19010034	D19010084	D19010134	
D19010035	D19010085	D19010135	
D19010036	D19010086	D19010136	
D19010037	D19010087	D19010137	
D19010038	D19010088	D19010138	
D19010039	D19010089	D19010139	
D19010040	D19010090	D19010140	
D19010041	D19010091		
D19010042	D19010092		
D19010043	D19010093		
D19010044	D19010094		
D19010045	D19010095		
D19010046	D19010096		
D19010047	D19010097		
D19010048	D19010098		
D19010049	D19010099		
D19010050	D19010100		

CNG1-356-120L-200BAR D19011:120PCS			
NO.	NO.	NO.	NO.
D19011001	D19011051	D19011101	
D19011002	D19011052	D19011102	
D19011003	D19011053	D19011103	
D19011004	D19011054	D19011104	
D19011005	D19011055	D19011105	
D19011006	D19011056	D19011106	



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D19011007	D19011057	D19011107	
D19011008	D19011058	D19011108	
D19011009	D19011059	D19011109	
D19011010	D19011060	D19011110	
D19011011	D19011061	D19011111	
D19011012	D19011062	D19011112	
D19011013	D19011063	D19011113	
D19011014	D19011064	D19011114	
D19011015	D19011065	D19011115	
D19011016	D19011066	D19011116	
D19011017	D19011067	D19011117	
D19011018	D19011068	D19011118	
D19011019	D19011069	D19011119	
D19011020	D19011070	D19011120	
D19011021	D19011071		
D19011022	D19011072		
D19011023	D19011073		
D19011024	D19011074		
D19011025	D19011075		
D19011026	D19011076		
D19011027	D19011077		
D19011028	D19011078		
D19011029	D19011079		
D19011030	D19011080		
D19011031	D19011081		
D19011032	D19011082		
D19011033	D19011083		
D19011034	D19011084		
D19011035	D19011085		
D19011036	D19011086		
D19011037	D19011087		
D19011038	D19011088		



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D19011039	D19011089		
D19011040	D19011090		
D19011041	D19011091		
D19011042	D19011092		
D19011043	D19011093		
D19011044	D19011094		
D19011045	D19011095		
D19011046	D19011096		
D19011047	D19011097		
D19011048	D19011098		
D19011049	D19011099		
D19011050	D19011100		

ZHEJIANG TIANEN PRESSURE VESSEL CO., LTD

