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No.: GJW2009-0749(XG1)

检验报告 TEST REPORT

NAME OF SAMPLE: 2V Sealed Valve regulated Gel battery

CLIENT: SEC Industrial Battery Company Ltd.

CLASSIFICATION OF TEST: Commission Test

Guangzhou Vkan Certification and Testing Institute
(CVC—former GTIHEA)




检验报告

TEST REPORT

No.: GJW2009-0749(XG1)

Page 2 of 14 Pages

Name of product: 2V Sealed Valve regulated Gel battery	Trade mark: SEC
Type/Model by: SEC 2ETG 500 7 OPzV 490 2V 500Ah SEC 2ETG 800 8 OPzV 800 2V 800Ah SEC 2ETG 1000 10 OPzV1000 2V 1000Ah	Sample status: —
Manufacturer by: Haze Battery Company Ltd.	Commissioned by: SEC Industrial Battery Company Ltd.
Manufacturer address: Xiangshuie, Dayawan Economy & Technology Development Zone, P. R. China	Commissioner address: Unit 6, 6/F hewlett Centre 54 Hoi Yuen Road Kwun Tong, KLN, H.K.
Quantity of sample: 6	Sampled by: —
Sample identification: SEC 2ETG 500 7 OPzV 490 1#~3# SEC 2ETG 800 8 OPzV 800 1#~3# SEC 2ETG 1000 10 OPzV1000 1#~3#	Sampling at (place): —
Means of receiving: Submitted by Manufacturer	Means of sampling: —
Classification of test: Commission Test	Sampling date: —
Receiving date: 2009-07-10	Completing date: 2009-09-22
Tested according to: IEC 60896-21:2004, IEC 60896-22:2004	Test item: 9 items
<p>Test conclusion:</p> <p>The 2V Sealed Valve regulated Gel batteries Submitted by SEC Industrial Battery Company Ltd. are tested according to IEC 60896-21:2004 Stationary lead-acid batteries- valve regulated types-methods of test and IEC 60896-22:2004 Stationary lead-acid batteries- - valve regulated types-requirements</p> <p>The test items are Gas emission, Protection against internal ignition from external spark sources, Protection against ground short propensity, Content and durability of required markings, Material identification, Valve operation, Flammability rating of materials, Intercell connector performance and Discharge capacity.</p> <p>The results of the tested items comply with the relevant requirements of the standards.</p> <div style="text-align: right; margin-top: 20px;">  <p>Seal of CVC Date of issue: 2009.09.22 检验专用章</p> </div>	

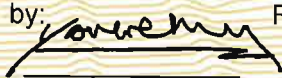
Huang Kun

Zhang Siyao

Approved by:

Reviewed by:

Tested by:





Description and illustration of the sample:

The samples' status is good.

Description of the sampling procedure:

Description of the deviation from the standard, if any:

Remarks:

Throughout this report a comma is used as the decimal separator.

The original test report of GJW2009-0749 was issued on Aug.31th, 2009. This is the first modification made on Sep.22th, 2009. Due to the modification of the manufacturer, the model of "SEC 2ETG 100 10 OPzV1000" is modified to "SEC 2ETG 1000 10 OPzV1000".

The report number of the involved pages, page 2, 3, 7, 9, 10 and 13 of this report, and the cover is changed from "GJW2009-0749" to "GJW2009-0749 (XG1)".

Photos and markings

SEC 2ETG800 8 OPzV 800 (2V, 800Ah)



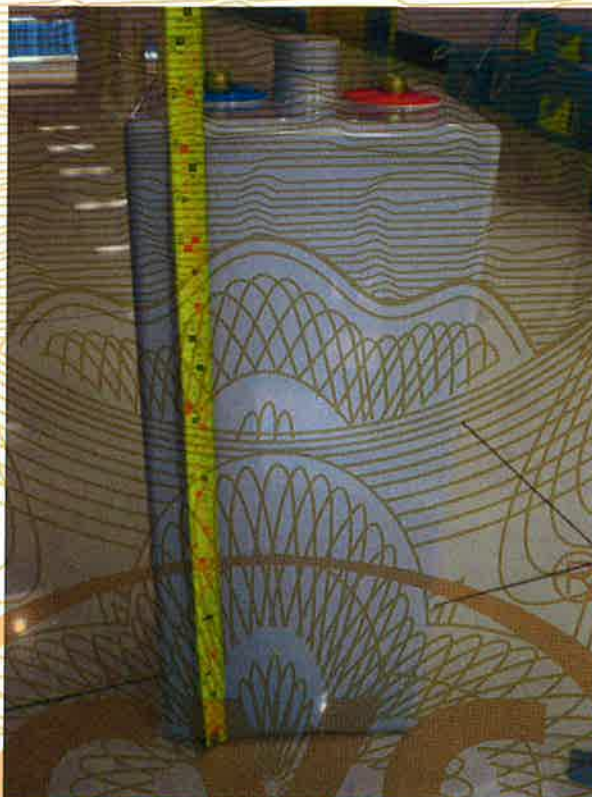
Photos and markings

SEC 2ETG 800 8 OPzV 800 (2V, 800Ah)



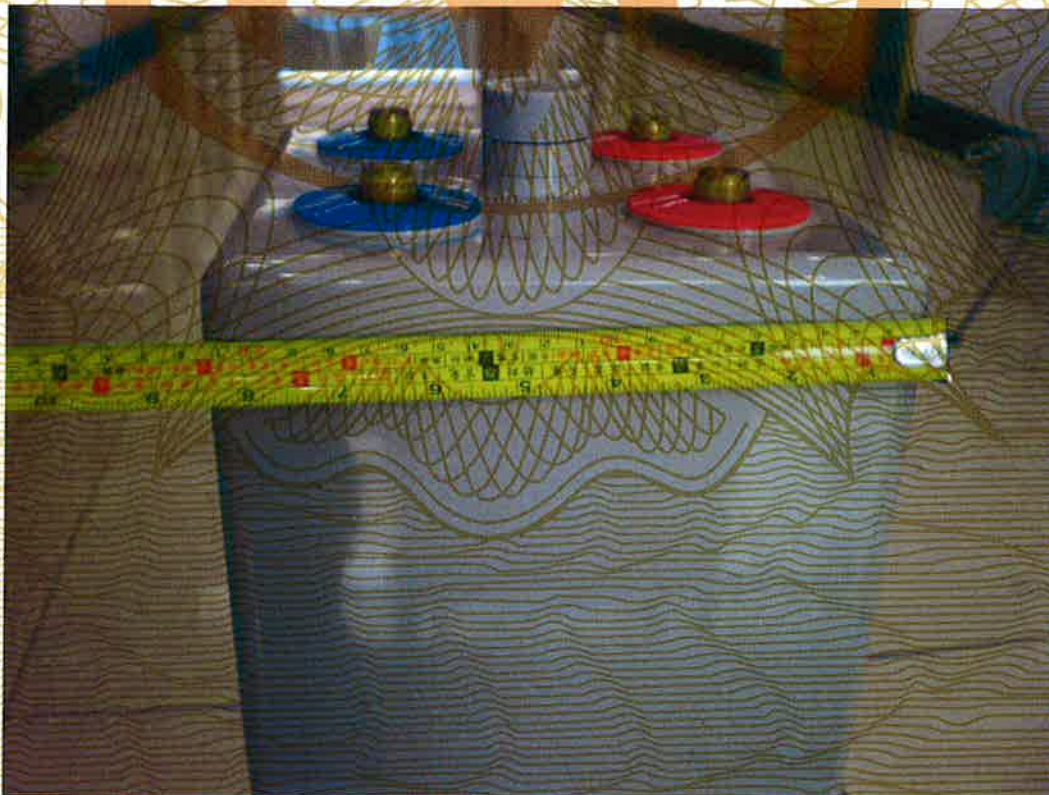
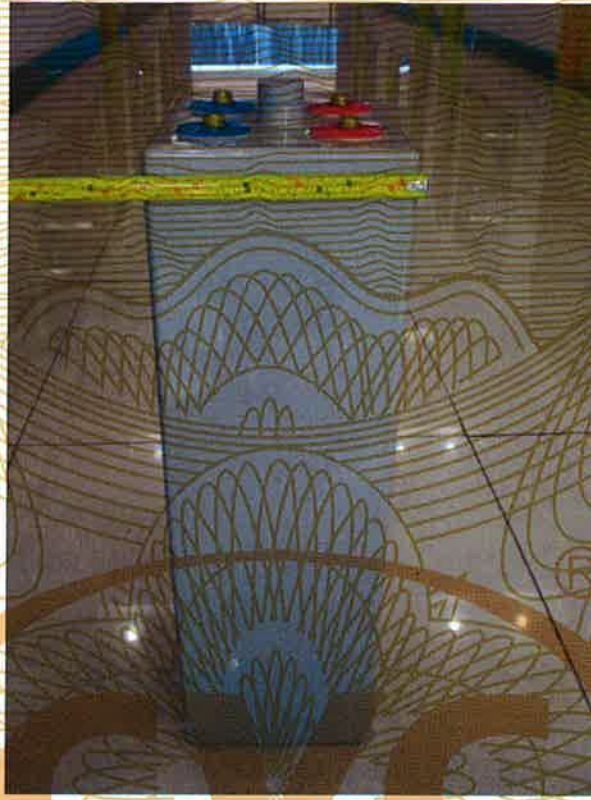
Photos and markings

SEC 2ETG 500 7 OPzV 490 (2V, 500Ah)



Photos and markings

SEC 2ETG 1000 10 OPzV1000 (2V, 1000Ah)



IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict
6	Safe operation requirements		
6.1	Gas emission		
	The test methods are according to clause 6.1.1 to 6.1.14 which are stated in the standard IEC 60896-21		
	Requirement and application: At the rated float charge voltage; state data for all applications: ml gas per cell, h and Ah at 20°C; Requirement and application: at 2,40Vpc overcharge voltage conditions; state data for all applications: ml gas per cell, h and Ah at 20°C;	see appended table A	State the value
6.2	High current tolerance		N
	The test methods are according to clause 6.2.1 to 6.2.6 which are stated in the standard IEC 60896-21		
	Requirement and application: Measure unit voltage, inspect and document the status of the top-lead and terminals of each unit after 30s current flow; Pass for all applications: Show evidence of no incipient melting or of no loss of electrical continuity after 30s of high current flow (value to be stated). After the completion of the specified discharge duration, the test shall stand for 5minutes in open circuit and their voltage measured and reported.		N
6.3	Short circuit current and d.c. internal resistance		N
	The test methods are according to clause 6.3.1 to 6.3.6 which are stated in the standard IEC 60896-21		
	Define prospective short-circuit value I_{sc} and internal resistance R_i of all units of a type range		N
6.4	Protection against internal ignition from external spark sources		P
	The test methods are according to clause 6.4.1 to 6.4.6 which are stated in the standard IEC 60896-21		
	Requirement and application: induce sparks near representative valve/barrier assemblies during emission Pass for all application: no evidence of rapid combustion or explosion beyond valve/barrier assemblies	No evidence of rapid combustion, no explosion beyond valve/barrier assemblies.	P

IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict
6.5	Protection against ground short propensity		P
	The test methods are according to clause 6.5.1 to 6.5.9 which are stated in the standard IEC 60896-21	No evidence of ground short, no leakage.	P
	Requirement and application: Operate units in different orientations and apply d.c. gradient; Pass for all applications: No evidence of ground short and leakage phenomena;		
6.6	Content and durability of required markings		P
	the durability of the marking shall be tested, consistent with 1.7.13 of IEC 60950-1,	The markings and following information are readable after rubbed 15s with water, petroleum, solution of sodium carbonate, and 40% in weight of H2SO4 in water respectively.	P
	Requirement and application: see table 9 and Table 10 in the standard IEC 60896-22		
6.7	Material identification		P
	The test methods are according to clause 6.7.1 to 6.7.4 which are stated in the standard IEC 60896-21	The ISO marking would be shown if it is required: ABS (V0 on request)	P
	Requirement and application: Inspect case and /or cover for ISO 1043-1 materials symbols. expose to chemicals. Pass for all applications: ISO symbols present on the outside of the cover or/and Case. Symbols shall remain readable after exposure to chemicals and remain in place		
6.8	Valve operation		P
	The test methods are according to clause 6.8.1 to 6.8.3 which are stated in the standard IEC 60896-21	SEC 2ETG 500 7 OPzV 490: Release is 19Kpa, Reseal is 10Kpa; SEC 2ETG 800 8 OPzV 800: Release is 21Kpa, Reseal is 10Kpa; SEC 2ETG 1000 10 OPzV1000: Release is 22Kpa, Reseal is 11Kpa.	P
	Requirement and application: Overcharge units and detect gas flow from the valve; Pass for all applications: Gas release detected before and after stress temperature impact test.		

IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict
6.9	Flammability rating of materials		P
6.9.3	The test methods are according to clause 6.9.1 to 6.9.4 which are stated in the standard IEC 60896-21		
	Requirement and application Determine flammability rating of case and cover material; State data for all applications: State the flammability rating level for samples of thickness equivalent to that of case and cover.	Flammability rating level : ABS(V0) Self-extinguishing	P
6.10	Intercell connector performance		P
	The test methods are according to clause 6.10.1 to 6.10.2 which are stated in the standard IEC 60896-21	SEC 2ETG 500 7 OPzV 490: Maximum temperature: 55°C;	
	Requirement and application: Measure and report maximum intercell connector temperature reached; State data for all applications: Stats maximum temperature reached.	SEC 2ETG 800 8 OPzV 800: Maximum temperature: 55°C; SEC 2ETG 1000 10 OPzV1000: Maximum temperature: 54°C.	P
6.11	Discharge capacity		P
	The test methods are according to clause 6.11.1 to 6.11.12 which are stated in the standard IEC 60896-21		
	Requirement and application: Determine actual capacity C_a ; C_a to be at least \times % of C_{rt} with all units at all rates shown below ; 10h \ 8h \ 3h \ 1h \ 0,25\ 1,80Vpc\1,75Vpc\ 1,70Vpc\ 1.60Vpc 1.60Vpc\ $C_a \geq 95\% C_{rt}$	see appended table B	State the value
6.12	Charge retention during storage		N
	The test methods are according to clause 6.12.1 to 6.12.7 which are stated in the standard IEC 60896-21		
	Requirement and application: Determine charge retention factor C_{rt} after 6 months of storage; Comply for all applications: $C_{rt} \geq 70\%$		N
6.13	Float service with daily discharges		N
	The test methods are according to clause 6.13.1 to 6.13.5 which are stated in the standard IEC 60896-21		N

IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict
	Requirement and application: see table 9 and Table 17 in the standard IEC60896-22		
6.14	Recharge behavior		N
	Requirement and application: Rbf24h 24h Recharge behavior factor $\geq 90\%$ Rbf168h 168h Recharge behavior factor $\geq 98\%$		N
6.15	Service life at an operating temperature of 40 °C		N
	The test methods are according to clause 6.15.1 to 6.15.5 which are stated in the standard IEC 60896-21		
	Requirement and application: Brief duration exposure time: ≥ 500 days; Medium duration exposure time: ≥ 750 days; Long duration exposure time: ≥ 1100 days Very long duration exposure time: ≥ 1700 days.		N
6.16	Impact of a stress temperature of 55 °C or 60 °C		N
	The test methods are according to clause 6.16.1 to 6.16.8 which are stated in the standard IEC 60896-21		
	Requirement and application: At 55°C Capacity monitored with 3h rate discharge test: Brief duration exposure time ≥ 150 days; Medium duration exposure time ≥ 250 days; Long duration exposure time ≥ 350 days; Very long duration exposure time ≥ 500 days.		N
6.17	Abusive over-discharge		N
	The test methods are according to clause 6.17.1 to 6.17.15 which are stated in the standard IEC 60896-21		
	Requirement and application: determine capacity ration Caod ,unbalanced sting over-discharge Coad, Coad $\geq 0,80$ (for the string)		
	Requirement and application: determine capacity ration Caoc ,unbalanced sting over-discharge Coac, Coac $\geq 0,90$ (for the string)		N

IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict
6.18	Thermal runaway sensitivity		N
	The test methods are according to clause 6.18.1 to 6.18.14 which are stated in the standard IEC 60896-21		
	Requirement and application: Comply for all applications: Achieve at least 1 week below 60°C at 2,45Vpc and at least 24h below 60°C at 2,60Vpc; Show ultimate time to 60°C or ultimate temperature after 168h at 2,45Vpc and 2,60Vpc.		N
6.19	Low temperature sensitivity		N
	The test methods are according to clause 6.19.1 to 6.19.13 which are stated in the standard IEC 60896-21		
	Requirement and application: show abusive low temperature service capacity (Cals) of all unit and report eventual freezing induced damages.		N
6.20	Dimensional stability at elevated internal pressure and temperature		N
	The test methods are according to clause 6.20.1 to 6.20.6 which are stated in the standard IEC 60896-21		
	Requirement and application: Show dimensional change in percentage and in mm.		N
6.21	Stability against mechanical abuse of units during installation		N
	The test methods are according to clause 6.21.1 to 6.21.6 which are stated in the standard IEC 60896-21		
	Requirement and application: Show leakage inspection results; No leakage detectable after two times two drops.		N

Type	SEC 2ETG 500 7 OPzV 490				SEC 2ETG 800 8 OPzV 800				SEC 2ETG 1000 10 OPzV1000			
	The 1 st	The 2 nd	The 3 rd	The 4 th	The 1 st	The 2 nd	The 3 rd	The 4 th	The 1 st	The 2 nd	The 3 rd	The 4 th
Uflo(V)=2.25 ml / (Ah · h · cell)	0,013	0,012	0,012	0,011	0,012	0,012	0,011	0,010	0,014	0,013	0,012	0,012
at 2,40Vpc overcharge ml / (Ah · h · cell)	0,016				0,0165				0,017			

Type	SEC 2ETG 500 7 OPzV 490					SEC 2ETG 800 8 OPzV 800					SEC 2ETG 1000 10 OPzV1000				
	C ₁₀ (Ah)	C ₈ (Ah)	C ₃ (Ah)	C (Ah)	C _{0.2} ₅ (Ah)	C ₁₀ (Ah)	C ₈ (Ah)	C ₃ (Ah)	C (Ah)	C _{0.2} ₅ (Ah)	C ₁₀ (Ah)	C ₈ (Ah)	C ₃ (Ah)	C (Ah)	C _{0.2} ₅ (Ah)
Crt	500	472	411	339	186	810	721	666	548	290	1015	958	834	687	345
1#	509,5	483,7	433,1	349,4	189,5	824,5	746,3	692,3	593,7	292,5	1035,3	979,8	872,6	749,2	380,6
2#	510,8	483,2	434,5	354,6	191,8	819,3	748,2	694,8	611,9	294,8	1024,6	972,5	864,9	741,5	371,3
3#	512,1	486,4	437,6	355,9	192,5	821,6	745,1	688,5	585,9	291,1	1028,2	975,4	866,5	744,3	374,4
%of Crt															
1#	101,9	102,5	105,4	103,1	101,9	101,8	102,0	103,9	108,3	100,8	102,0	102,3	104,6	109,1	110,3
2#	102,2	102,4	105,7	104,6	103,1	101,1	102,3	104,3	111,6	101,6	100,9	101,5	103,7	107,9	107,6
3#	102,4	103,1	106,5	105,0	103,5	101,4	101,9	103,3	106,9	100,3	101,3	101,8	103,9	108,3	108,5

注 意 事 项 Important

1. 报告无检验单位公章无效。
The test report is invalid without the official stamp of CVC,
2. 未经本试验室书面同意, 不得部分地复制本报告。
Any photocopies or part photocopies of the test report are forbidden without the written permission from CVC,
3. 报告无负责人、审核人签名无效。
The test report is invalid without the signatures of Author and Reviewer,
4. 报告涂改无效。
The test report is invalid if altered,
5. 对检验报告若有异议, 应于收到报告之日起十五天内向检验单位提出。
Objections to the test report must be submitted to CVC within 15 days,
6. 一般情况, 委托检验仅对来样负责。
Generally, commission test is responsible for the tested samples only,
7. 检验结果中“N”表示“不适用”, “P”表示“通过”, “F”表示“不通过”。
As for the test result, “N” means “not applicable”, “P” means “pass” and “F” means “fail”,

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