



IECEX TEST REPORT of PARTIAL TESTING

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Standards..... : IEC 60079-11, Ed.6(2011) / EN 60079-11:2012
 Test procedure : IECEx System
 Test Report Form Number..... : ExTR Partial Testing (released 2011-07)

Instructions for Intended Use of ExTR Addendum:

An ExTR of Partial Testing provides a clause-by-clause documentation of the initial evaluation and testing that verified compliance of an item or product with only select requirements from an IEC Ex standard. This ExTR of Partial Testing is part of an ExTR package that may include other Ex Test Report, Addendum and National Differences documents, along with a single ExTR Cover. An ExTR of Partial Testing is to be compiled and reviewed by the ExTL. The Issuing ExCB indicates final approval of the ExTR of Partial Testing as part of the overall ExTR package on the associated ExTR Cover.

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Possible test case verdicts:

- test case does not apply to the test item:N / A
- test item does meet the requirement:Pass

General remarks:

The test results presented in this ExTR of Partial Testing relate only to the item or product tested, and do not represent a complete evaluation and testing of the item or product.

- "(see Attachment #)" refers to additional information appended to this document.
- "(see appended table)" refers to a table appended to this document.
- Throughout this document, a point is used as the decimal separator.

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IEC 60079-11, Ed.6(2011) / EN 60079-11:2012

Clause	Requirement – Test	Result – Remark	Verdict
10.5	Tests for cells and batteries		
10.5.1	General	Tests were carried out with non-rechargeable cells. The resistance of the short-circuit link used is less than 3 mΩ.	Pass
10.5.2	Electrolyte leakage test for cells and batteries	Ten test samples were subjected to short circuit until discharged. The samples were placed vertically over a piece of blotting paper for a period of at least 24h after the applications of test. Refers to measurement section for results.	Pass
10.5.3	Spark ignition and surface temperature of cells and batteries	The test samples do not include internal current-limiting device. Spark ignition testing was not carried out. Internal resistance of cell was determined from the measurement of open circuit voltage and short-circuit current of cells. The maximum surface temperature of cells was determined at the same time as tests in §10.5.2 above. Cells were heated up to the required maximum ambient temperature in a climatic chamber. Temperature of cells was measured by using thermocouple mounted on the metal surface (plastic decoration removed) in the middle of cell cylindrical body. Refers to Measurement section for results.	Pass
10.5.4	Battery container pressure tests	This test was not considered	N/A

The reference of battery which have been subjected to tests :

Saft LS33600, Li-SOCl₂, D size, nominal voltage = 3.6 V, nominal capacity = 17.0 Ah, operating temperature = -60°C to +85°C.

Test results :

Sample	U _{open} (V)	I _{sc} (A)	R _i (Ω)	T _a (°C)	T _{cell} (°C)	Leakage
1	3.69	2.76	1.34	23.3	111.0	No
2	3.68	2.65	1.39	23.3	110.6	No
3	3.68	2.72	1.35	23.3	109.8	No
4	3.68	2.75	1.34	23.4	109.6	No
5	3.68	2.73	1.35	23.4	108.9	No
6	3.68	3.07	1.20	60.2	110.8	No
7	3.68	3.14	1.17	60.1	111.6	No
8	3.68	2.99	1.23	60.2	109.8	No
9	3.68	3.15	1.17	60.1	112.4	No
10	3.68	3.18	1.16	60.1	112.2	No

Key : U_{open} = peak open circuit voltage; I_{sc} = peak short circuit current; R_i = internal resistance; T_a = test ambient temperature; T_{cell} = surface temperature of cell.

Maximum short-circuit current = 3.18 A

Maximum surface temperature = 112.4°C at ambient temperature up to 60.0°C

No leakage of electrolyte after 24 h.

Conclusion :

The results of test show that the cell **Saft LS33600** comply with the requirements of §10.5.2 and §10.5.3 of IEC 60079-11, Ed.6(2011) / EN 60079-11:2012 standard. When using within an intrinsic safety certified apparatus, its conformity shall be verified as regard the spark ignition test.