

## TEST REPORT N° 94220 – 587934

<b>TO :</b>	VITZROCELL , CO., Ltd 256-41 DUGOK-ri Shinam-Myon, Yesan-Gun, Chungnam KOREA 143-837
<b>SUBJECT :</b>	Type verifications and type tests on cells SB-D02 3.6 V TEKCELL Lithium size D.

Date of tests : 2009/09/04 to 2009/09/07

This document includes : 08 pages

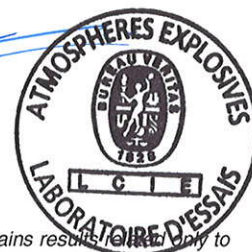
Fontenay-aux-Roses, 2009/09/07

The technical manager :

Name : *D. Ravreau*

Visa :

*[Signature]*



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## 1. SUBJECT :

### 1.1. Description

The laboratory conducted the electrolyte leakage test for cells of ten test samples (SB-D02 3.6 V Lithium TEKCELL size D with terminals TC type). The test is a short circuit until the discharge

### 1.2. Standards reference

The products are tested according to the standard :

- EN 60079-11 (2007)

## 2. REFERENCE DOCUMENTS

Documents	Drawings N° Ref	Rev.	Date
VITZROCELL Product data catalogue, page 10	NONE	NONE	NONE

## 3. NATURE OF THE TESTS :

Each test shall be realized in the configuration of the electrical apparatus considered to be the most unfavourable.

### 3.1. Electrolyte leakage test for cells

#### 3.1.1. Conditions

Applicable standard :	EN 60079-11
Article :	10.5.2
Prototype or sample tested :	SB-D02 3.6 V TEKCELL Lithium size D
Number of sample :	10
Aera of tests :	Fontenay aux Roses
Date jj/mm/aaaa :	04/09/2009 au 07/09/2009
Technician :	LSp HKe

#### 3.1.2. Measurement for the test

The results are listed in Annex 4.1.

### 3.1.3. Observations

There is no visible trace of electrolyte leakage on the blotter or on the external surfaces of test samples after 12 h.

There is no mechanics failure of test specimens.

The test samples do not fire.

There is no explosion of test samples.

The temperature rise is 75.3 K.


The results on the samples tested (SB-D02 3.6 V Lithium TEKCELL size D) are satisfactory for all terminals TC, ST, 2pin, 3pin, 3pinW, AX etc...

### 3.2. Tests and measurement tools used :

Désignation	Immatriculation
Siemens	A 744 2029
Multimeter	A 124 0145
Shunt	A 109 1063
Shunt	A 109 1234

## 4. ANNEX

### 4.1. Test result


<p>FILE n° 588045 For : VITZROCELL Tech : SPENDEL laurent (LSp) KETTAM Hanafi (HKe)</p>	<p>Date : 04/09/2009</p> 
<p><b>SHORT - CIRCUIT TEST</b></p>	
<p>Test n° <span style="border: 1px solid black; padding: 2px;">1</span></p>	
<p>Standard : EN 60079-11 : 2007 Clause : §10.5</p>	<p>Devices: Siemens : A7442029 Multimeter : A1240045 Shunts : A1091033 / A1091234</p>
<p>Reference : SB-D02 3.6V Serial N° : -</p>	<p>Step : TEKCELL Lithium size D</p>

**PARAMETERS :**  
 Tambiant = 17,1°C to 21,6°C  
 Cells : New  
 Rext < 3mΩ  
 Observation : to + 12h

**RESULTS :** PASS

No rupture  
 No explosion  
 No fire  
 No visible sign on the blotting paper  
 T(ext) < 170°C

**Remarks :** -



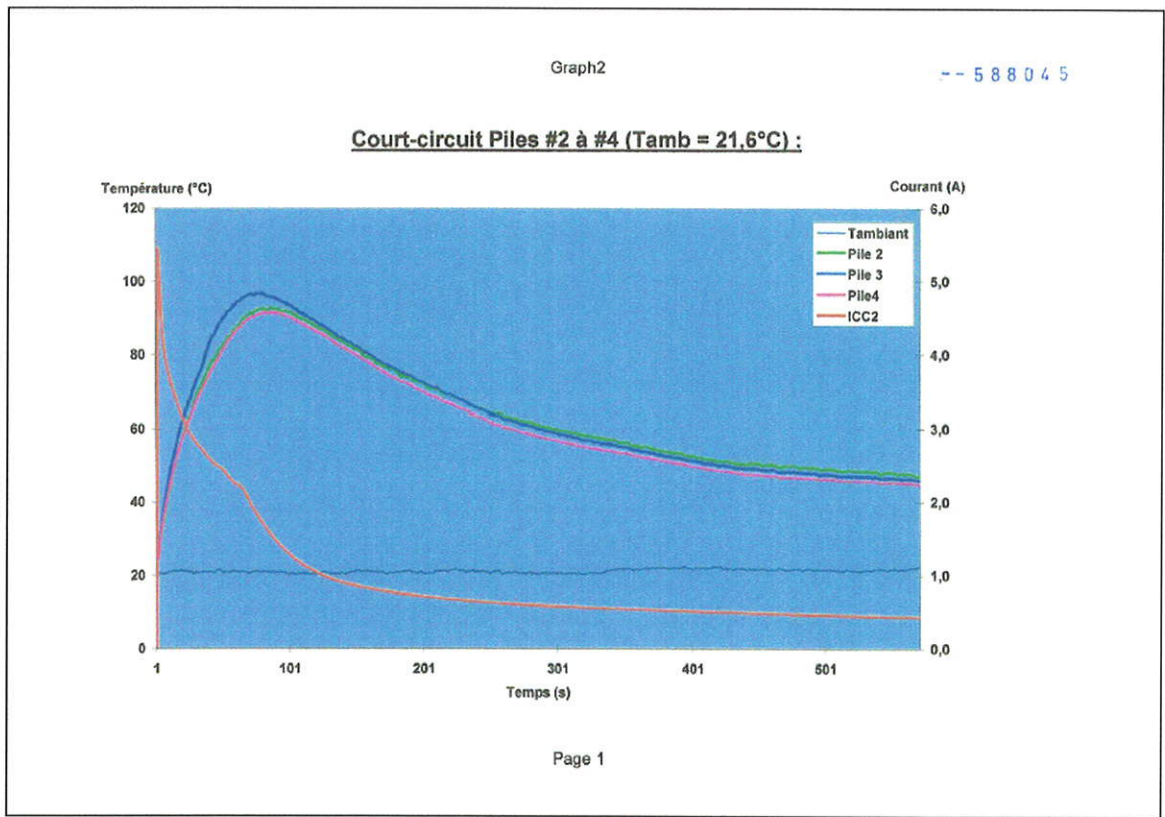
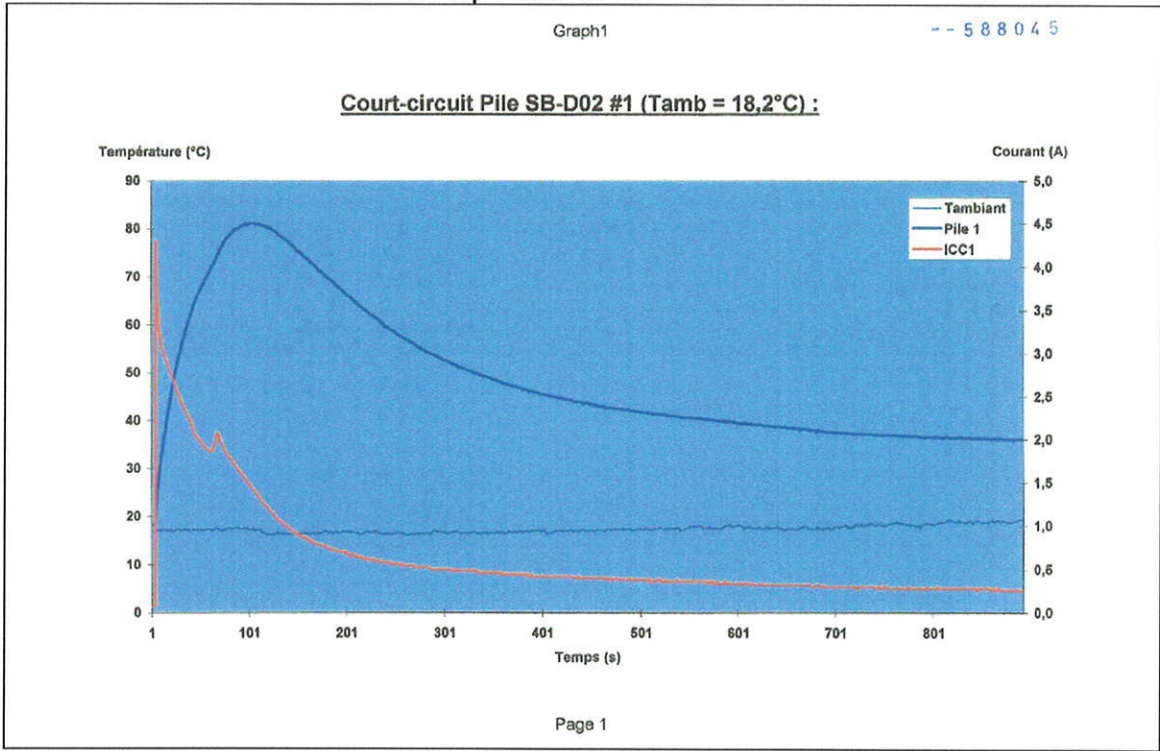
RUN1 :					
Thermocouples	Sample	U0 (Volt)	Icc (A)	Temperature MAX (°C)	Signs on paper ?
2	Sample 1	3.67	4,30	81,1	No
1	Ambiant = 18,2°C				

RUN2 :					
Thermocouples	Sample	U0 (Volt)	Icc (A)	Temperature MAX (°C)	Signs on paper ?
2	Sample 2	3.67	5,5	92,7	No
3	Sample 3	3.67		96,9	No
4	Sample 4	3.67		91,5	No
1	Ambiant = 21,6°C				

RUN3 :					
Thermocouples	Sample	U0 (Volt)	Icc (A)	Temperature MAX (°C)	Signs on paper ?
2	Sample 5	3.67	5,2	90,2	No
3	Sample 6	3.67		96,3	No
4	Sample 7	3.67		90,1	No
1	Ambiant = 17,1°C				

RUN4 :					
Thermocouples	Sample	U0 (Volt)	Icc (A)	Temperature MAX (°C)	Signs on paper ?
2	Sample 8	3.67	3,9	89,9	No
3	Sample 9	3.67		90,7	No
4	Sample 10	3.67		90,8	No
1	Ambiant = 19,4°C				

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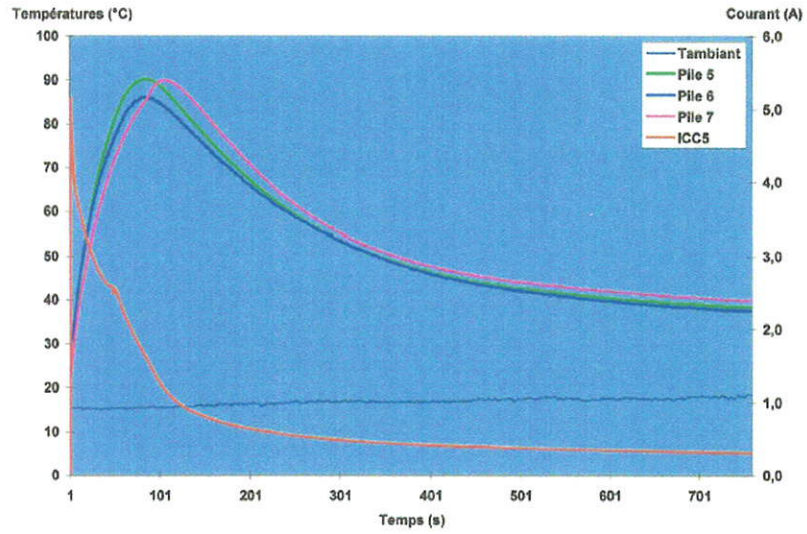


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Graph3

-- 588045

**Court-circuit Piles #5 à #7 (Tamb = 17,1°C) :**



#### 4.2. Maximum uncertainties chart result

This chart shows the maximum uncertainties values according to test that may be related in this document.

<i>Test</i>	<b>Mesurement uncertainty (k = 2)</b>
Current measurement	± 2,1%
Voltage measurement	± 2,1%
Resistance measurement	± 2%
Time or time interval	
• From 1s to 9min	± 0,3s
• > 9min	± 0,1%
Temperature measurement (directly by thermocouple)	± 2,8°C