SECONDARY BATTERY
TESTING & CERTIFICATION REQUIREMENT

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Presented by;

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Presentation Outline

• A brief introduction - SIRIM QAS International

• Battery Testing & Requirement of Standard

• Certification requirement
  • Type 1b certification (batch certification/consignment)
  • Type 5 Certification
About Us

Established in 1996 as SIRIM Berhad's wholly-owned subsidiary

Conformity assessment services since 1970s

Staff strength: 760

Malaysian based, internationally recognised

Local and international clients

Malaysia’s Leading Certification, Inspection and Testing Body
# Our Services

<table>
<thead>
<tr>
<th>CERTIFICATION</th>
<th>TESTING</th>
<th>INSPECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Management System Certification</td>
<td>• Product compliance testing to standards, regulatory requirements and specifications</td>
<td>• Engineering Inspection</td>
</tr>
<tr>
<td>• Product Certification</td>
<td></td>
<td>• Inspection on behalf of other CBs</td>
</tr>
<tr>
<td>• Personnel Certification</td>
<td></td>
<td>• Other 3rd party inspections</td>
</tr>
</tbody>
</table>
Accreditations & Recognitions
Appointments By National Agencies /Regulatory Bodies

- JABATAN KESELAMATAN DAN KESIHATAN PEKERJAAN MALAYSIA
- Suruhanjaya Komunikasi dan Multimedia Malaysia (SKMM)
- Kementerian Kesihatan Malaysia
- SMECORP
- JPU (Jawatankuasa Pengurusan Jalan Malaysia)
- Suruhanjaya Tenaga (Energy Commission)
- KPDNKK
- Mtcc
- MPOB
- MITI (Malaysia)
Connect with SIRIM QAS international to get the latest development on industry topics, news and events. Join us via our official social media platforms as below:

- **Facebook**: [https://www.facebook.com/SIRIMQASInternational](https://www.facebook.com/SIRIMQASInternational)
- **Twitter**: [https://twitter.com/SIRIMQASInt](https://twitter.com/SIRIMQASInt)
- **YouTube**: [https://www.youtube.com/SIRIMQASInternational](https://www.youtube.com/SIRIMQASInternational)
- **LinkedIn**: [https://www.linkedin.com/SIRIMQASInternational](https://www.linkedin.com/SIRIMQASInternational)
Battery : Reported incidents
Some reported incident ......

“Power bank bakar paha”
- Harian Metro Khamis
25 Ogos 2016

This happened while the man
was charging his phone with
the power bank in his pocket

Paha wanita ini cedera
gara-gara telefon bimbit
miliknya meletup dalam
saku seluar
Some reported incident …….

A laptop / notebook computer that burst into flames at a Japanese Conference in June 2006, in Osaka Japan
- the fire and explosion was due to a faulty lithium battery

– source The Inquirer 2006 (July)
What are the likely cause(s) of such incidents .......

3 things that can potentially make the device (i.e. power bank, hand phone, electronics cigarettes (vape), laptop, hover board) **explode**;

1. **Poor Battery Quality**
   - Made of cheaper material – to save cost
   - Some manufacturers use recycled batteries

2. **Wrong circuit design**

3. **Improper or wrong usage**
   - Expose to high temperatures or humidity
   - Overcharging

Remember – do not use power banks in your pocket

A power bank should have a good circuit design incorporating with:

*Power protection*: This is a mechanism that ensures that the battery stops charging once it has reached full capacity.

*Short circuit control*: It's circuit fully insulated to prevent short circuit.

*Temperature control*: ... such that once it hits a particular temperature, it shuts down to cool off.
The cost of non-compliance of secondary batteries to……

1) User
   - might expose risks to user’s safety, health
   - If incidents happen – resulted in injury or in worst case, fatality
   - Less value for money - purchase / use of unsafe product and/or of low quality, less reliable

2) Supplier / importer / manufacturer
   - Cost of product recall (if required)
   - affect company’s reputation
   - unable to sell

3) Regulator / country
   - Influx of low quality / sub standard product in the market
   - become an issue - safety issue / dumping ground etc…
How can SIRIM assist?

SIRIM will always playing it’s roles in providing assistance to industry & regulator in fighting issue of sub standard products

How?

a) through compliance testing
b) through our product certification scheme
c) through SIRIM’s market surveillance activities
d) by carrying out verification testing on samples picked up from market - through enforcement & market surveillance –by regulator (ST, SKMM…etc)
e) by providing a support to KPDNKK initiatives to raise the issue of sub-standard or unsafe product (batteries) to the widest audience possible
Battery:
Testing Services & Requirement
OUR CURRENT SERVICES…on battery testing..

- **Primary Battery**:
  - **Standard**: MS IEC 60086
  - **Type of battery**: Size-AA, AAA, AAAA, C, D and 9V
  - **Application**: Primary batteries designed or intended for consumer and household such as – torch light, remote control etc…
  - **Regulation**: KPDNKK’s Consumer Protection (Safety Standards for Primary Batteries) Regulations 2013

- **Secondary Battery**.
  - **Standard**: MS IEC 62133: Secondary cells and batteries containing alkaline or other non-acid electrolytes
  - **Type of battery**: Lithium-ion, Nickel cadmium
  - **Application**: Batteries for laptop, mobile-phone, vape, power bank etc…
  - **Regulation**: To be regulated by KPDNKK’s

- **Automotive Battery**.
  - **Standard**: IEC 60095, MS 45
  - **Type of battery**: Lead-acid battery
  - **Application**: Batteries for automotive industry
Facilities Available

- 2 units of Battery Tester 56 channel
- 1 unit of Battery Tester 24 channel
- Temperature and Humidity Recorder
- Water bath
- Hot Chamber
- Cyclic Chamber
- Vacuum Chamber
- Vibration Machine
- Impact Tester
- Tensile Machine
Secondary Batteries (also known as rechargeable batteries)
- is a group of one or more secondary cells.
- use electrochemical reactions that are electrically reversible.
- come in many different sizes and use different combination of chemicals

Commonly used secondary cell (“rechargeable battery”) chemistries are:

1) Lead acid
2) Nickel cadmium (NiCd)
3) Nickel metal hydride (NiMH)
4) Lithium ion (Li-ion) and
5) Lithium ion polymer (Li-ion polymer)

for a mobile phone
for a powerbank
for a Note book
for an e-cigarette
for a vape
Test Standards

***Test standards are in place that mandate a number of individual tests designed to assess specific safety risks associated with the use of secondary batteries

**MS IEC 62133:2017 –**
Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable appliances

It is a total adoption of **IEC 62133:2012 (IDT)**

Those 2 standards cross refer to **IEC 62281** - standard requirement for transport tests
Based on the reference standard which is IEC 62133, all the tests are described in clause 8 (for lithium system)

- **Clause 8.1: Charging procedure for test purposes**
  - Clause 8.1.1: First procedure
  - Clause 8.1.2: Second procedure

- **Clause 8.2: Intended use**
  - Clause 8.2.1: Continuous charging at constant voltage (cells)
  - Clause 8.2.2: Moulded case stress at high ambient temperature battery

- **Clause 8.3: Reasonably foreseeable misuse**
  - Clause 8.3.1: External short circuit (cell)
  - Clause 8.3.2: External short circuit (battery)
  - Clause 8.3.3: Free fall
  - Clause 8.3.4: Thermal abuse (cells)
  - Clause 8.3.5: Crush (cells)
  - Clause 8.3.6: Over-charging of battery
  - Clause 8.3.7: Forced discharge (cells)
  - Clause 8.3.8: *Transport tests (refer IEC 62281)*
  - Clause 8.3.9: Design evaluation (*Not Applicable*)

- **Note:** if the battery of a nickel systems, then clause 7 is applicable.
Clause 8.3.8: **Transport tests (refer IEC 62281)**
- This standard cover transport tests for IEC 62133
- This test required **20 pcs battery** which have to undergo all the tests as listed below (in sequence).
  - Clause 6.4: Transport tests
  - Clause 6.4.1 – Altitude
  - Clause 6.4.2 – Thermal cycling
  - Clause 6.4.3 – Vibration
  - Clause 6.4.4 – Shock
  - Clause 6.4.5 – External short-circuit
  - Clause 6.4.6 – Impact/crush

**Clause 10: Marking**
- Clause 10.2: Battery marking
- Clause 8.1.2: Second procedure

**Clause 11: Packaging.**
Testing & certification Process
**A battery supplier which includes importer, manufacturer and trader**

**GENERAL PROCESS**

1. Application by **a SUPPLIER**

2. Test report?
   - NO
   - YES

   **Apply for testing**

   Requirement of a **FULL TYPE TEST** report:
   
   a) Issued by an accredited test lab
   b) Reference standard - either MS IEC 62133:2017 or IEC 62133:2012
   c) Shall contain specific product information such as **Brand name** and **model no.**

3. **Apply for Product Certification (Type 5 or Type 1b)**

   Applicant submits test report to SIRIM QAS for product certification process
APPLICATION FOR TESTING

A supplier includes importer, manufacturer and trader.

A supplier submit a complete test application with
- Product information
- sufficient quantity as specified by standard

SIRIM QAS International test lab performs a full type test to a standard (to MS IEC 62133:2017 or IEC 62133:2012 + National Deviation(if any)

SIRIM QAS International test lab shall issue a full type test report

The report shall then be used for submission for an application for product certification
**Application for Certification**

**A battery supplier which includes importer, manufacturer and trader**

- **Application by a Supplier**
  - a) Applicant submits test report to SIRIM QAS (certification body) for application of labels or certification mark
  - b) SIRIM QAS will conduct scheme Type 5 or Type 1b certification process
  - c) SIRIM QAS shall issue label

- **Local Manufacturer**
  - Apply Product Certification Scheme (Type 5)

- **Foreign Manufacturer / Importer (Trader)**
  - Apply Product Certification Scheme (Type 5)
  - Apply Batch Certification Scheme (Type 1b) (Consignment)
Product Certification Process
Type 1b (Consignment/Batch)
PROCESS FLOW: BATCH CERTIFICATION SCHEME (TYPE 1b)

Application by **a SUPPLIER (importer)**

- a) Submits application
- b) Document required;
  - i) A Full type test report
  - ii) Bill of lading
  - iii) Invoice / Packing list

Document evaluation

Evaluation on a full type test report + all of the submitted document (as above)

Batch arrival

Sample at warehouse

Sampling & Inspection

SIRIM QAS will conduct consignment sampling & inspection

Verification - Test* & Evaluation

Passed

- SIRIM QAS will issue label based on no. of imported quantity

Failed

No label

Recommendation & Approval

Submit company profile + certification to KPDNKK

* Not a full type test
It’s a confirmatory test / partial test to ensure that imported products are the same products as per declared in the full type test report
Product Certification Process (Type 5)
PROCESS FLOW : PRODUCT CERTIFICATION SCHEME (TYPE 5)

a) Submits application
b) Document required;
   i) Application form
   ii) A full type test report
   iii) Technical file/documentation
   iv) Other administrative requirements

Evaluation on a full type test report + all of the submitted document (as above)

SIRIM QAS will conduct factory audit, sampling & verification testing (if any)

SIRIM QAS will issue license and issue label

Submit company profile + certification to KPDNKK
Application and Documents Evaluation

- Questionnaire Form (ePCS/FOR/01-1)
- Application Form (ePCS/FOR/01-2)
- Declaration of Approval from relevant authority (ePCS/FOR/01-3)*
- Declaration of Purpose for obtaining SIRIM License (ePCS/FOR/01-3.1)*
- Declaration of Trade Mark (ePCS/FOR/01-4)
- Authorization Letter of Trade Mark (ePCS/FOR/01-4.1)
- Declaration from Manufacturer (ePCS/FOR/01-5)*

Note: * - whenever applicable

http://www.sirim-qas.com.my/
PROCESS FLOW: PRODUCT CERTIFICATION SCHEME (TYPE 5)
- Surveillance and Renewal process

Factory Annual Surveillance
And Market Sampling

- Does’t comply
  - Suspension / Revocation

- Comply
  - Renewal
Contact Information

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Product certification scheme

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THANK YOU FOR YOUR KIND ATTENTION

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