

---

**Cestna vozila - Polnilne baterije z notranjim shranjevanjem energije - Zmogljivost in trajnost modulov in baterij za električna vozila z alkalnimi-ionskimi (Li-Ion, Na-Ion), Pb, NiMH in kombiniranimi kemijskimi sestavinami**

Road vehicles - Rechargeable batteries with internal energy storage - Performance and durability of alkali-Ion (Li-Ion, Na-Ion), Pb, NiMH and combined chemistries EV modules and batteries

Straßenfahrzeuge - Wiederaufladbare Batterien mit internem Speicher - Unmittelbare Leistung von Modulen und Batterien für Elektrofahrzeuge mit Li-Ion, Pb, NiMH und kombinierter Chemie

Véhicules routiers - Batteries rechargeables avec stockage interne d'énergie - Performance des modules et batteries alcali-ion (Li-Ion, Na-Ion), Pb, NiMH et chimies combinées pour véhicules électriques

<https://standards.iteh.ai/catalog/standards/sist/0196aba6-e75f-4c15-b69e-f591296b22eb/sist-en-18060-2025>

**Ta slovenski standard je istoveten z: EN 18060:2025**

---

**ICS:**

|           |                          |                           |
|-----------|--------------------------|---------------------------|
| 29.220.99 | Drugi členi in baterije  | Other cells and batteries |
| 43.120    | Električna cestna vozila | Electric road vehicles    |

**SIST EN 18060:2025**

**en,fr,de**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 18060**

October 2025

ICS 29.220.20; 43.120

English Version

**Road vehicles - Rechargeable batteries with internal  
energy storage - Performance and durability of alkali-Ion  
(Li-Ion, Na-Ion), Pb, NiMH and combined chemistries EV  
modules and batteries**

Véhicules routiers - Batteries rechargeables avec  
stockage interne d'énergie - Performance et durabilité  
des modules et batteries alcalins-ion (Li-Ion, Na-Ion),  
Pb, NiMH et des chimies combinées pour véhicules  
électriques

Straßenfahrzeuge - Wiederaufladbare Batterien mit  
internem Speicher - Unmittelbare Leistung von  
Modulen und Batterien für Elektrofahrzeuge mit Li-Ion,  
Pb, NiMH und kombinierter Chemie

This European Standard was approved by CEN on 27 July 2025.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

| <b>Contents</b>                                                                                                                                                                 | <b>Page</b> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| European foreword .....                                                                                                                                                         | 4           |
| Introduction .....                                                                                                                                                              | 5           |
| 1 Scope.....                                                                                                                                                                    | 6           |
| 2 Normative references.....                                                                                                                                                     | 6           |
| 3 Terms and definitions.....                                                                                                                                                    | 6           |
| 4 Abbreviated terms.....                                                                                                                                                        | 13          |
| 5 General requirements.....                                                                                                                                                     | 14          |
| 5.1 Prerequisites for performance tests.....                                                                                                                                    | 14          |
| 5.2 Accuracy of measurement equipment and measured values.....                                                                                                                  | 14          |
| 6 Requirements.....                                                                                                                                                             | 15          |
| 6.1 Preconditioning cycles.....                                                                                                                                                 | 15          |
| 6.1.1 Purpose.....                                                                                                                                                              | 15          |
| 6.1.2 Test procedure.....                                                                                                                                                       | 15          |
| 6.2 Standard cycle (SC).....                                                                                                                                                    | 15          |
| 6.2.1 Purpose.....                                                                                                                                                              | 15          |
| 6.2.2 Test procedure.....                                                                                                                                                       | 15          |
| 6.3 Rated capacity (in Ah) and capacity fade (in %) .....                                                                                                                       | 16          |
| 6.3.1 Purpose.....                                                                                                                                                              | 16          |
| 6.3.2 Test procedure.....                                                                                                                                                       | 16          |
| 6.3.3 Determination of the rated capacity (in Ah) and capacity fade (in %) .....                                                                                                | 17          |
| 6.4 Determination of internal resistance (in $\Omega$ ) and internal resistance increase (in %) .....                                                                           | 17          |
| 6.5 Testing of partly charged DUT .....                                                                                                                                         | 18          |
| 6.6 Determination of power (in W) and power fade (in %) .....                                                                                                                   | 18          |
| 6.7 Determination of energy round trip efficiency and its fade (in %) .....                                                                                                     | 19          |
| 6.8 Determination of nominal power .....                                                                                                                                        | 20          |
| 6.9 Energy .....                                                                                                                                                                | 20          |
| 6.10 Ratio of nominal power and discharge energy .....                                                                                                                          | 20          |
| 6.11 Expected lifetime .....                                                                                                                                                    | 20          |
| 7 Test report.....                                                                                                                                                              | 21          |
| Annex A (normative) Simplified requirements for individual battery testing due to change of status (status 're-used', 'remanufactured' and 'preparation for repurposing') ..... | 23          |
| A.1 Preconditioning – purpose .....                                                                                                                                             | 23          |
| A.2 Capacity (in Ah) .....                                                                                                                                                      | 23          |
| A.2.1 Purpose.....                                                                                                                                                              | 23          |
| A.2.2 Test procedure.....                                                                                                                                                       | 23          |
| A.2.3 Determination of capacity (in Ah) .....                                                                                                                                   | 24          |
| A.3 Determination of internal resistance (in $\Omega$ ) .....                                                                                                                   | 24          |
| A.4 Testing of partly charged DUT .....                                                                                                                                         | 25          |

|                               |                                                                                                                                                                                                                                                                                                                                       |           |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>A.5</b>                    | <b>Determination of power (in W) .....</b>                                                                                                                                                                                                                                                                                            | <b>25</b> |
| <b>A.6</b>                    | <b>Determination of energy round trip efficiency (in %) .....</b>                                                                                                                                                                                                                                                                     | <b>26</b> |
| <b>A.7</b>                    | <b>Determination of estimated remaining lifetime .....</b>                                                                                                                                                                                                                                                                            | <b>26</b> |
| <b>Annex ZA (informative)</b> | <b>Relationship between this European Standard and the requirements of Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 concerning batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC aimed to be covered .....</b> | <b>27</b> |
| <b>Bibliography</b>           | <b>.....</b>                                                                                                                                                                                                                                                                                                                          | <b>29</b> |

iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

SIST EN 18060:2025

<https://standards.iteh.ai/catalog/standards/sist/0196aba6-e75f-4c15-b69e-f591296b22eb/sist-en-18060-2025>