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TECHNICAL REPORT

Electrochemical capacitor for use in electrical energy storage

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Electrochemical capacitor for use in electrical energy storage

FOREWORD

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IEC 63650 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
40/3294/DTR	40/3312/RVDTR

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

1 Scope

This technical report investigates the primary technological approaches, current applications, and development prospects of electrochemical capacitors (supercapacitors). In particular, this document also analyses the technical solutions and characteristics of electrochemical capacitor applications in the field of Electrical Energy Storage (EES) and provides representative application cases. Then, the testing items of the electrochemical capacitors for use in EES are introduced for the cells and modules, respectively.

By collecting the existing standards of electrochemical capacitor , this document identifies the gap between the existing IEC and ISO standards and the actual needs of electrochemical capacitors used in EES and proposes descriptions and a roadmap for future standardization of electrochemical capacitors in the field of EES. This work will promote the rapid progress and broader applications of electrochemical capacitors in the field of EES.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/
– ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
electrochemical capacitor
supercapacitor
device that stores electrical energy using a double layer in an electrochemical cell

Note 1 to entry: An electrochemical capacitor, at least one electrode primarily stores energy through a double-layer capacitance formed at the electrode and electrolyte interface. The relationship curve between time and voltage during constant current charging or discharging is usually approximately linear.

Note 2 to entry: The electrochemical capacitor is not to be confused with electrolytic capacitors (IEC 60050-114:2014 [1], 114-03-04).

[SOURCE: IEC 60050-114:2014 [1], 114-03-03, modified — Note 1 to entry has been added.]

3.1.2
electric double-layer capacitor
device that stores electrical energy using a double layer in an electrochemical cell, and whose positive and negative electrodes are of the same material

Note 1 to entry: The electrolytic capacitor is not included in capacitor of this document.

[SOURCE: IEC 62576:2018 [2], 3.13]