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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 42847.2-2023

**Energy storage systems using fuel cell modules in reverse mode - Part
2: Test procedures for the performance of single cells and stacks with
proton exchange membranes, including reversible operation**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is Part 2 of GB/T 42847 "Reversible Mode Fuel Cell Modules for Energy Storage Systems". GB/T 42847 has been released

The following sections are included.

---Part 2.Reversible mode proton exchange membrane single cell and stack performance test methods;

---Part 3.Electrical energy storage system performance test methods.

This document is equivalent to IEC 62282-8-102.2019 "Fuel cell technology Part 8-102.Using reversible mode fuel cell models"

Performance testing method of reversible mode proton exchange membrane cell and stack of block energy storage system.

This document has made the following minimal editorial changes.

---For the convenience of standard use, the standard name is modified to. "Reversible Mode Fuel Cell Module for Energy Storage Systems Part 2.Reversible Mode

Proton exchange membrane single cell and stack performance test methods";

---For the convenience of standard use, the units of some symbols are modified (see 3.2);

--- In order to follow the principles of national standard compilation, add guidance words before the items of "precision", "accuracy" and "uncertainty" (see 5.6).

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

Energy storage systems using reversible mode can effectively utilize excess electric energy and promote power regulation and renewable energy utilization.

GB/T 42847 focuses on the performance of energy storage systems based on electrochemical modules (a combination of fuel cells and electrolytic cells, or reversible fuel cells).

Ability to test methods.

GB/T 42847 "Reversible Mode Fuel Cell Modules for Energy Storage Systems" aims to establish the storage requirements based on reversible mode fuel cell modules.

The performance testing method of the energy system is planned to consist of three parts.

---Part 1.Reversible mode solid oxide cell and stack performance test methods. The purpose is to give the solid oxide single cell and

Test systems, instruments and measurement methods and tests for performance testing of stacks in fuel cell mode, electrolysis and/or reversible mode method.

---Part 2.Reversible mode proton exchange membrane single cell and stack performance testing methods. The purpose is to give the proton exchange membrane single cell and

Test systems, instruments and measurement methods and tests for performance testing of stacks in fuel cell mode, electrolysis and/or reversible mode method.

---Part 3.Electrical energy storage system performance test methods. The purpose is to give performance tests of hydrogen-based electrical energy storage systems method.

Reversible mode fuel cell module for energy storage system

Part 2.Reversible Mode Proton Exchange Membrane Single Cell vs.

Stack performance testing method

1 Scope

This document specifies the proton exchange membrane for performance testing of proton exchange membrane cells/stacks in fuel cell mode, electrolysis and/or reversible mode.

Membrane replacement cell/stack components, test systems, instruments and measurement methods, and test methods.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

vocabulary(IEV)-Part 485.Fuelceltechnologies)

3.1 Terms and definitions

The terms and definitions defined in IEC 60050-485.2020 and the following apply to this document.

3.1.1

activeelectrodearea

The geometric area of an electrode perpendicular to the direction of current flow.

Note. It is usually the smaller of the area of the negative electrode or the positive electrode.

[Source. IEC 60050-485.2020, 485-02-08, with modifications. the term name is modified to "electrode active area", and comments are added]

3.1.2

area-specificresistance;ASR

Internal resistivity relative to the effective active area of the electrode, including polarization caused by electrochemical reactions.

3.1.3

catalystcatalyst

Substances that speed up reaction processes but are not consumed themselves.

Note. Catalysts reduce the activation energy of the reaction, thereby increasing the reaction rate.

3.1.4

Catalyst-coated membrane catalyst-coated membrane; CCM

[In a proton exchange membrane fuel cell (3.1.24)] Polymerization of a surface coated with a catalytic layer (3.1.5) that forms the reaction zone of the electrode (3.1.8) material film.

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