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BSI Standards Publication

Fuel cell technologies

Part 7-1: Test methods — Single cell performance tests for polymer electrolyte fuel cells (PEFC)

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee GEL/105, Fuel cell technologies.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Part 7-1: Test methods – Single cell performance tests for polymer electrolyte fuel cells (PEFC)

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FOREWORD

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Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62282-7-1, which is a Technical Specification, has been prepared by IEC technical committee 105: Fuel cell technologies.

This second edition cancels and replaces the first edition published in 2010. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) addition of new tests, mainly regarding transportation applications; and,
b) restructuring of the format: basic and applied performance test methods.

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

Enquiry draft	Report on voting
105/568/DTS	105/621/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 62282 series, published under the general title: *Fuel cell technologies*, can be found on the IEC website.

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

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 62282 describes standard single-cell test methods for polymer electrolyte fuel cells (PEFCs). This document provides consistent and repeatable methods to test the performance of single cells. This document should be used by component manufacturers or stack manufacturers who assemble components in order to evaluate the performance of cell components, including membrane-electrode assemblies (MEAs) and flow plates. This document is also available for fuel suppliers to determine the maximum allowable impurities in fuels.

Users of this document can selectively execute test items suitable for their purposes from those described in this document. This document is not intended to exclude any other methods.

FUEL CELL TECHNOLOGIES –

Part 7-1: Test methods – Single cell performance tests for polymer electrolyte fuel cells (PEFC)

1 Scope

This document covers cell assemblies, test station setup, measuring instruments and measuring methods, performance test methods, and test reports for PEFC single cells.

This document is used for evaluating:

a) the performance of membrane electrode assemblies (MEAs) for PEFCs in a single cell configuration;
b) materials or structures of PEFCs in a single cell configuration; or,
c) the influence of impurities in fuel and/or in air on the fuel cell performance.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14687-2, *Hydrogen fuel – Product specification – Part 2: Proton exchange membrane (PEM) fuel cell applications for road vehicles*

3 Terms and definitions

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

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

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

3.1
anode
electrode (3.8) at which the oxidation of fuel (3.11) takes place

3.2
catalyst
substance that accelerates (increases the rate of) a reaction without being consumed itself

Note 1 to entry: The catalyst lowers the activation energy of the reaction, allowing for an increase in the reaction rate.

3.3
catalyst-coated membrane
CCM
<in a PEFC (3.24)> membrane whose surfaces are coated with a catalyst layer (3.4) to form the reaction zone of the electrode (3.8)