

# TECHNICAL SPECIFICATION

Fuel cell technologies –  
Part 7-1: Single cell test methods for polymer electrolyte fuel cell (PEFC)



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Part 7-1: Single cell test methods for polymer electrolyte fuel cell (PEFC)

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## FUEL CELL TECHNOLOGIES –

**Part 7-1: Single cell test methods  
for polymer electrolyte fuel cell (PEFC)**

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

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

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

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
105/241/DTS	105/253A/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 62282 series, 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 web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be 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- withdrawn,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.

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## INTRODUCTION

This Technical Specification describes standard single-cell test methods for polymer electrolyte fuel cells (PEFCs); it provides consistent and repeatable methods to test the performance of single cells. This Technical Specification is to 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 Technical Specification is also available for fuel suppliers to determine the maximum allowable impurities in fuels.

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

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## FUEL CELL TECHNOLOGIES –

### Part 7-1: Single cell test methods for polymer electrolyte fuel cell (PEFC)

#### 1 Scope

This part of IEC 62282 covers cell assemblies, test apparatus, measuring instruments and measuring methods, performance test methods, and test reports for PEFC single cells.

This Technical Specification is used for evaluating:

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

#### 2 Normative references

The following referenced documents are indispensable for the application 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.

IEC/TS 62282-1:2010, *Fuel cell technologies – Part 1: Terminology*

ISO/TS 14687-2:2008, *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:

##### 3.1

##### **anode**

the electrode at which fuel oxidation takes place by the removal of electrons from the fuel to the external electric load, concurrent with the release of protons ( $H^+$ ) to the polymer electrolyte

##### 3.2

##### **catalyst**

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

The catalyst lowers the activation energy of the reaction, allowing for an increase in the reaction rate. This is also referred to as an electrocatalyst, as defined in IEC/TS 62282-1.

##### 3.3

##### **catalyst-coated membrane**

##### **CCM**

term used to describe a membrane (in a PEFC) whose surfaces are coated with a layer of catalyst to form the reaction zone of the electrode