SLOVENSKI STANDARD
SIST EN IEC 62282-8-101:2020

01-julij-2020

Tehnologije gorivnih celic - 8-101. del: Sistemi za shranjevanje energije, ki uporabljajo module gorivnih celic v obrnjeni smeri - Preskusni postopki za lastnosti enojne oksidne gorivne celice in sklada celic, vključno z obrnjenim delovanjem (IEC 62282-8-101:2020)

Fuel cell technologies - Part 8-101: Energy storage systems using fuel cell modules in reverse mode - Test procedures for the performance of solid oxide single cells and stacks, including reversible operation (IEC 62282-8-101:2020)

Brennstoffzellentechnologien - Teil 8-101: Energiespeichersysteme mit Brennstoffzellenmodulen im Umkehrbetrieb - Testprozeduren für Festoxid-Brennstoffzellen, Einzelzellen oder Stack zur Ermittlung des Leistungsverhalten einschließlich Umkehrbetrieb (IEC 62282-8-101:2020)

Technologies des piles à combustible - Partie 8-101: Système de stockage de l'énergie utilisant des modules à piles à combustible en mode inversé - Procédures d'essai pour la performance des cellules élémentaires et des piles à oxyde solide, comprenant le fonctionnement réversible (IEC 62282-8-101:2020)

Ta slovenski standard je istoveten z: **EN IEC 62282-8-101:2020**

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27.070	Gorilne celice	Fuel cells

SIST EN IEC 62282-8-101:2020 **en**

EUROPEAN STANDARD

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EN IEC 62282-8-101

April 2020

ICS 27.070

English Version

Fuel cell technologies - Part 8-101: Energy storage systems using fuel cell modules in reverse mode - Test procedures for the performance of solid oxide single cells and stacks, including reversible operation (IEC 62282-8-101:2020)

Technologies des piles à combustible - Partie 8-101: Système de stockage de l'énergie utilisant des modules à piles à combustible en mode inversé - Procédures d'essai pour la performance des cellules élémentaires et des piles à oxyde solide, comprenant le fonctionnement réversible (IEC 62282-8-101:2020)

Brennstoffzellentechnologien - Teil 8-101: Energiespeichersysteme mit Brennstoffzellenmodulen im reversiblen Betrieb - Prüfverfahren zum Leistungsverhalten von Festoxid-Einzelzellen und -Stacks einschließlich reversiblem Betrieb (IEC 62282-8-101:2020)

This European Standard was approved by CENELEC on 2020-03-24. CENELEC 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.

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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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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

Ref. No. EN IEC 62282-8-101:2020 E

European foreword

The text of document 105/765/FDIS, future edition 1 of IEC 62282-8-101, prepared by IEC/TC 105 "Fuel cell technologies" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62282-8-101:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-12-24
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-03-24

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62282-8-101:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 62282-8-102	NOTE	Harmonized as EN IEC 62282-8-102
IEC 62282-8-201	NOTE	Harmonized as EN IEC 62282-8-201

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60050-485	-	International Electrotechnical Vocabulary - Part 485: Fuel cell technologies	-	-
IEC 61515	2016	Mineral insulated metal-sheathed thermocouple cables and thermocouples	EN 61515	2016
IEC 60584-1	-	Thermocouples - Part 1: EMF specifications and tolerances	EN 60584-1	-
IEC 60584-3	-	Thermocouples - Part 3: Extension and compensating cables - Tolerances and identification system	EN 60584-3	-
ISO 5168	-	Measurement of fluid flow - Procedures for the evaluation of uncertainties	-	-
ISO 6141	-	Gas analysis - Contents of certificates for calibration gas mixtures	EN ISO 6141	-
ISO 6142-1	-	Gas analysis - Preparation of calibration gas mixtures - Part 1: Gravimetric method for Class I mixtures	EN ISO 6142-1	-
ISO 6143	-	Gas analysis - Comparison methods for determining and checking the composition of calibration gas mixtures	EN ISO 6143	-
ISO 6145-7	-	Gas analysis - Preparation of calibration gas mixtures using dynamic volumetric methods - Part 7: Thermal mass-flow controllers	EN ISO 6145-7	-
ISO 6974	series	Natural gas - Determination of composition and associated uncertainty by gas chromatography	EN ISO 6974	series

ISO 7066-2	-	Assessment of uncertainty in the calibration and use of flow measurement devices - Part 2: Non-linear calibration relationships	-	-
ISO 8756	-	Air quality - Handling of temperature, pressure and humidity data	EN ISO 8765	-

IEC 62282-8-101

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

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FUEL CELL TECHNOLOGIES –

Part 8-101: Energy storage systems using fuel cell modules in reverse mode – Test procedures for the performance of solid oxide single cells and stacks, including reversible operation

FOREWORD

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International Standard IEC 62282-8-101 has been prepared by IEC technical committee 105: Fuel cell technologies.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
105/765/FDIS	105/779/RVD

Full information on the voting for the approval of this International Standard 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 in 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 document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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 document describes test methods for a single cell or stack (denoted as "cell/stack" hereafter) that are intended for application to energy storage systems using solid oxide fuel cells (SOFC) in combination with solid oxide electrolysis cells (SOEC), or directly using reversible solid oxide cells (Re-SOC, see Note in Clause 1). The test methods aim to provide guidelines for the characterization of real-time performance and durability of the cell/stack.

SOFC, SOEC and Re-SOC have a broad range of geometries (e.g. planar, tubular and their variations) and size. As such, in general, peripherals like current collectors and gas manifolds are unique to each cell or stack and are often incorporated into a cell or stack to form one integrated unit. In addition, they tend to have a significant effect on the power generation characteristics of the cell or stack. This document therefore introduces as its subject "cell/stack assembly units", which are defined as those units containing not only a cell or a stack but also peripherals.

This document is generally applicable to all types or geometries of SOFC, SOEC and Re-SOC, unless where explicitly mentioned.

IEC 62282-8 (all parts) aims to develop performance test methods for power storage and buffering systems based on electrochemical modules (combining electrolysis and fuel cells, in particular reversible fuel cells), taking into consideration both options of re-electrification and substance (and heat) production for sustainable integration of renewable energy sources.

Under the general title "Energy storage systems using fuel cell modules in reverse mode", the IEC 62282-8 series will consist of the following parts:

- IEC 62282-8-101: *Test procedures for the performance of solid oxide single cells and stacks, including reversible operation*

- IEC 62282-8-102: *Test procedures for the performance of single cells and stacks with proton exchange membranes, including reversible operation*
- IEC 62282-8-103[1]: *Alkaline single cell and stack performance including reversible operation*
- IEC 62282-8-201: *Test procedures for the performance of power-to-power systems*
- IEC 62282-8-202[2]: *Power-to-power systems – Safety*
- IEC 62282-8-300 series[3]: *Power-to-substance systems*

As a priority dictated by the emerging needs for industry and opportunities for technological development, IEC 62282-8-101, IEC 62282-8-102 and IEC 62282-8-201 have been initiated jointly and as a priority. These documents are presented as a package to highlight the need for an integrated approach as regards the system application (i.e. a solution for energy storage) and its fundamental constituent components (i.e. fuel cells operated in reverse or reversible mode).

IEC 62282-8-103, IEC 62282-8-202 and IEC 62282-8-300 (all parts) are suggested but are left for initiation at a later stage.

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1 Under consideration.

2 Under consideration.

3 Under consideration.