
Tehnologije gorivnih celic - 4-102. del: Elektroenergetski sistemi z gorivnimi celicami za industrijske kamione na električni pogon - Preskusne metode zmogljivosti (IEC 62282-4-102:2022)

Fuel cell technologies - Part 4-102: Fuel cell power systems for electrically powered industrial trucks - Performance test methods (IEC 62282-4-102:2022)

Brennstoffzellentechnologien - Teil 4-102: Antriebe mit Brennstoffzellen-Energiesystemen für elektrisch angetriebene Flurförderzeuge - Leistungskennwertepfverfahren (IEC 62282-4-102:2022)

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Leistungskennwertprüfverfahren
(IEC 62282-4-102:2022)

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European Committee for Electrotechnical Standardization
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 62282-4-102:2023 (E)**European foreword**

The text of document 105/947/FDIS, future edition 2 of IEC 62282-4-102, prepared by IEC/TC 105 "Fuel cell technologies" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62282-4-102:2023.

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) 2023-10-24
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-01-24

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The text of the International Standard IEC 62282-4-102:2022 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 standard indicated:

IEC 61672-1	NOTE Approved as EN 61672-1
IEC 62282-3-200:2015	NOTE Approved as EN 62282-3-200:2016 (not modified)
IEC 62282-3-201	NOTE Approved as EN 62282-3-201
IEC 62282-4-101:2022	NOTE Approved as EN IEC 62282-4-101:2022 (not modified)
ISO 5815 (series)	NOTE Approved as EN ISO 5815 (series)
ISO 6976	NOTE Approved as EN ISO 6976
ISO 9000	NOTE Approved as EN ISO 9000
ISO 9001	NOTE Approved as EN ISO 9001
ISO 9004	NOTE Approved as EN ISO 9004
ISO 10523	NOTE Approved as EN ISO 10523

Annex A (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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62282-6-300	2012	Fuel cell technologies - Part 6-300: Micro fuel cell power systems - Fuel cartridge interchangeability	EN 62282-6-300	2013
ISO 6798-1	-	Reciprocating internal combustion engines - Measurement of sound power level using sound pressure - Part 1: Engineering method		-
ISO 6798-2	-	Reciprocating internal combustion engines - Measurement of sound power level using sound pressure - Part 2: Survey method		-
ISO 14687	-	Hydrogen fuel quality - Product specification		-



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Part 4-102: Fuel cell power systems for electrically powered industrial trucks –
Performance test methods

Technologies des piles à combustible –
Partie 4-102: Systèmes à piles à combustible pour chariots de manutention
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CONTENTS

FOREWORD	5
INTRODUCTION	7
1 Scope	8
2 Normative references	9
3 Terms and definitions	9
4 Symbols	11
5 Standard conditions	13
6 Heating value base	13
7 Test preparation	13
7.1 General	13
7.2 Data acquisition plan	14
8 Test set-up	14
9 Instruments and measurement methods	15
9.1 General	15
9.2 Measurement instruments	15
9.3 Measurement points	16
9.4 Minimum required measurement systematic uncertainty	17
10 Test conditions	17
10.1 Laboratory conditions	17
10.2 Installation and operating conditions of the system	17
10.3 Indication of battery condition	17
10.4 Determination of state of charge of the battery	18
10.5 Quality of test fuel	18
10.5.1 Hydrogen	18
10.5.2 Methanol solution	18
11 Fuel consumption test	18
11.1 Hydrogen fuel consumption test	18
11.1.1 General	18
11.1.2 Test method	18
11.1.3 Calculation of results	19
11.2 Methanol fuel consumption test	21
11.2.1 General	21
11.2.2 Test method	21
11.2.3 Calculation of average methanol fuel power input	21
12 Electric power output test	22
12.1 General	22
12.2 Test method	22
12.3 Calculation of average electric power output	22
12.4 Computation of electric efficiency	22
13 Type tests on operational performance	23
13.1 Maximum power output test	23
13.1.1 General	23
13.1.2 Test method	23
13.1.3 Processing of data	23
13.2 Power cycling electric load test	23

13.2.1	General	23
13.2.2	Test method	23
13.2.3	Processing of data	23
13.3	Accessory load voltage spike test	24
13.3.1	General	24
13.3.2	Test method	24
13.3.3	Processing of data	24
14	Power stability under operation	24
14.1	General	24
14.2	Delivered power	24
14.3	Regenerated power	25
15	Type tests on environmental performance	25
15.1	General	25
15.2	Noise test	25
15.2.1	General	25
15.2.2	Test conditions	26
15.2.3	Test method	27
15.2.4	Processing of data	27
15.3	Exhaust gas test	27
15.3.1	General	27
15.3.2	Components to be measured	27
15.3.3	Test method	28
15.3.4	Processing of data	28
15.4	Discharge water test	30
15.4.1	General	30
15.4.2	Test method	30
16	Test reports	31
16.1	General	31
16.2	Title page	31
16.3	Table of contents	31
16.4	Summary report	31
16.5	Checklist for performance parameters	31
Annex A (informative) Heating values for hydrogen and methanol at standard conditions		32
Annex B (informative) Guidelines for the contents of detailed and full reports		33
B.1	General	33
B.2	Detailed report	33
B.3	Full report	33
Annex C (informative) Checklist for performance criteria dealt with in this document		34
Bibliography		37
Figure 1 – Fuel cell power systems for electrically powered industrial trucks		9
Figure 2 – Example of a test set-up for hydrogen fuel		14
Figure 3 – Example of a test set-up for methanol fuel		15
Figure 4 – Energy flow for regenerated power and delivered power		24
Figure 5 – Noise measurement points for fuel cell power systems		26

Table 1 – Symbols and their meanings for electric and thermal performance	11
Table 2 – Symbols and their meanings for environmental performance	12
Table 3 – Delivered power measurements	25
Table 4 – Regenerated power measurements	25
Table 5 – Correction values corresponding to the effect of background noise	27
Table A.1 – Heating values for hydrogen and methanol at standard conditions	32

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FUEL CELL TECHNOLOGIES –**Part 4-102: Fuel cell power systems for electrically powered industrial trucks – Performance test methods**

FOREWORD

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IEC 62282-4-102 has been prepared by IEC technical committee 105: Fuel cell technologies. It is an International Standard.

This second edition cancels and replaces the first edition published in 2017. This edition constitutes a technical revision.

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

- a) alignment of the Scope with the second edition of IEC 62282-4-101:2022;
- b) deletion of terms and definitions (previous entries 3.5, 3.10, and 3.15);
- c) addition of new terms in Clause 3: "delivered power" (3.13) and "regenerated power" (3.14);
- d) revision of symbols and their meanings in alignment with those of IEC 62282-3-201;
- e) replacement of "reference conditions" with "standard conditions" as seen in Clause 5;
- f) revision of the test method for the accessory load voltage spike test (13.3.2);

- g) addition of clarifications in Clause 14 (Power stability under operation);
- h) addition of a checklist for performance criteria dealt with in this document (Annex C).

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

Draft	Report on voting
105/947/FDIS	105/954/RVD

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 International Standard 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.

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 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.

INTRODUCTION

This part of IEC 62282-4 provides consistent and repeatable test methods for the electric, thermal and environmental performance of fuel cell power systems for electrically powered industrial trucks.

The IEC 62282-4 series deals with categories such as safety, performance, and interchangeability of fuel cell power systems for propulsion other than road vehicles and auxiliary power units (APUs). This document (IEC 62282-4-102) focuses on performance test methods for fuel cell power systems used to drive industrial electric trucks, which are being manufactured and used increasingly worldwide. This is because such applications are urgently needed in the world.

This part of IEC 62282-4 describes type tests and their test methods only. No routine tests are required or identified, and no performance targets are set in this document.

Fuel cell systems used in electrically powered industrial trucks, such as forklift trucks, use both batteries and fuel cells, and so operate in several different modes. Similarly, forklift trucks operate in different modes. The purpose of this document is to evaluate the fuel cell system in the various combinations of fuel cell modes and forklift truck modes. This document breaks down these different modes and provides a framework for designing and evaluating a fuel cell system for use specifically in a forklift truck.

This part of IEC 62282-4 is intended to be used by either manufacturers of fuel cell power systems used for electrically powered industrial trucks or those who evaluate the performance of the systems used in them for certification purposes or both.

Users of this document can select and perform the tests they need from those described. This document is not intended to exclude any other tests.

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