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CONTENTS

FOREWORD.....	9
1 Scope.....	12
1.1 General.....	12
1.2 Fuels and technologies covered.....	12
1.3 Equivalent level of safety.....	14
2 Normative references.....	14
3 Terms and definitions.....	15
4 Materials and construction of micro fuel cell power systems, micro fuel cell power units and fuel cartridges.....	19
4.1 General.....	19
4.2 FMEA / hazard analysis.....	19
4.3 General materials.....	19
4.4 Selection of materials.....	19
4.5 General construction.....	20
4.6 Fuel valves.....	20
4.7 Materials and construction – system.....	21
4.8 Ignition sources.....	21
4.9 Enclosures and acceptance strategies.....	22
4.9.1 Parts requiring a fire enclosure.....	22
4.9.2 Parts not requiring a fire enclosure.....	22
4.9.3 Materials for components and other parts outside fire enclosures.....	23
4.9.4 Materials for components and other parts inside fire enclosures.....	24
4.9.5 Mechanical enclosures.....	25
4.10 Protection against fire, explosion, corrosivity and toxicity hazard.....	25
4.11 Protection against electrical hazards.....	26
4.12 Fuel supply construction.....	26
4.12.1 Fuel cartridge construction.....	26
4.12.2 Fuel cartridge fill requirement.....	27
4.13 Protection against mechanical hazards.....	27
4.13.1 Piping and tubing other than fuel lines.....	27
4.13.2 Exterior surface and component temperature limits.....	27
4.13.3 Motors.....	28
4.14 Construction of electric device components.....	29
4.14.1 Limited power sources.....	29
4.14.2 Devices that use electronic controllers.....	30
4.14.3 Electrical conductors/wiring.....	30
4.14.4 Output terminal area.....	31
4.14.5 Electric components and attachments.....	31
4.14.6 Protection.....	31
5 Abnormal operating and fault conditions testing and requirements.....	32
5.1 General.....	32
5.2 Compliance testing.....	32
5.3 Passing criteria.....	33

5.4	Simulated faults and abnormal conditions for limited power and SELV circuits	33
5.5	Abnormal operation – electromechanical components	33
5.6	Abnormal operation of micro fuel cell power systems or units with integrated batteries	34
5.7	Abnormal operation – simulation of faults based on hazard analysis.....	34
6	Instructions and warnings for micro fuel cell power systems, micro fuel cell power units and fuel cartridges	35
6.1	General	35
6.2	Minimum markings required on the fuel cartridge.....	35
6.3	Minimum markings required on the micro fuel cell power system	35
6.4	Additional information required either on the fuel cartridge or on accompanying written information or on the micro fuel cell power system or micro fuel cell power unit.....	36
6.5	Technical documentation.....	36
7	Type tests for micro fuel cell power systems, micro fuel cell power units and fuel cartridges	37
7.1	General	37
7.2	Leakage measurement of methanol and the measuring procedure.....	38
7.3	Type tests	45
7.3.1	Pressure differential tests	45
7.3.2	Vibration test	47
7.3.3	Temperature cycling test	48
7.3.4	High temperature exposure test.....	49
7.3.5	Drop test	49
7.3.6	Compressive loading test	50
7.3.7	External short-circuit test.....	51
7.3.8	Surface, component and exhaust gas temperature test.....	52
7.3.9	Long-term storage test	52
7.3.10	High-temperature connection test.....	57
7.3.11	Connection cycling tests	57
7.3.12	Emission test.....	60
	Annex A (normative) Formic acid micro fuel cell power systems.....	65
	Annex B (normative) Hydrogen stored in hydrogen absorbing metal alloy and micro fuel cell power systems.....	97
	Annex C (normative) Reformed methanol micro fuel cell power systems	146
	Annex D (normative) Methanol clathrate compound micro fuel cell power systems.....	160
	Annex E (normative) Borohydride micro fuel cell power systems: Class 8 (corrosive) compounds in indirect borohydride fuel cells.....	184
	Annex F (normative) Borohydride micro fuel cell power systems: Class 4.3 (water reactive) compounds in indirect borohydride fuel cells	242
	Annex G (normative) Borohydride micro fuel cell power systems: Class 8 (corrosive) compounds in direct borohydride fuel cells.....	300
	Annex H (normative) Butane solid oxide micro fuel cell power systems.....	347
	Bibliography.....	386

Figure 1 – Micro fuel cell power system block diagram.....	13
Figure 2 – Fuel cartridge leakage and mass loss test flow chart for pressure differential, vibration, drop, and compressive loading tests.....	39
Figure 3 – Fuel cartridge leakage and mass loss test flow chart for temperature cycling test and high temperature exposure test	40
Figure 4 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for pressure differential, vibration, temperature cycling, drop and compressive loading tests.....	41
Figure 5 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for external short-circuit test	42
Figure 6 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for 68 kPa low external pressure test	43
Figure 7 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for 11,6 kPa low external pressure test	44
Figure 8 – Temperature cycling.....	49
Figure 9 – Fuel cartridge leakage and mass loss test flow chart for long-term storage test ..	56
Figure 10 – Operational emission rate testing apparatus.....	61
Figure 11 – Operational emission concentration testing apparatus.....	61
Figure A.1 – Formic acid micro fuel cell power system block diagram – Replaces Figure 1	65
Figure A.2 – Fuel cartridge leakage and mass loss test flow chart for pressure differential, vibration, drop, and compressive loading tests – Replaces Figure 2	71
Figure A.3 – Fuel cartridge leakage and mass loss test flow chart for temperature cycling test and high temperature exposure test – Replaces Figure 3	72
Figure A.4 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss flow chart for pressure differential, vibration, temperature cycling test, drop, and compressive loading tests – Replaces Figure 4.....	73
Figure A.5 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for external short-circuit test – Replaces Figure 5	74
Figure A.6 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for 68 kPa low external pressure test – Replaces Figure 6.....	75
Figure A.7 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for 11,6 kPa low external pressure test – Replaces Figure 7.....	76
Figure A.9 – Fuel cartridge leakage and mass loss test flow chart for long-term storage test – Replaces Figure 9	83
Figure A.10 – Operational emission rate testing apparatus – Replaces Figure 10	84
Figure A.11 – Operational emission concentration testing apparatus – Replaces Figure 11	85
Figure A.12 – Hydrogen emission test procedure for operating micro fuel cell power system.....	93
Figure B.2 – Fuel cartridge leakage test flow chart for pressure differential, vibration, drop, and compressive loading tests – Replaces Figure 2.....	108
Figure B.3 – Fuel cartridge leakage test flow chart for temperature cycling test and high temperature exposure test – Replaces Figure 3	109
Figure B.4 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss flow chart for pressure differential, vibration, temperature cycling, drop, and compressive loading tests – Replaces Figure 4.....	110
Figure B.5 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for external short-circuit test – Replaces Figure 5	111

Figure B.8 – Temperature cycling – Replaces Figure 8	121
Figure B.9 – Fuel cartridge hydrogen leakage and mass loss test flow chart for long-term storage test – Replaces Figure 9	132
Figure B.10 – Operational emission rate testing apparatus – Replaces Figure 10	138
Figure B.12 – Hydrogen emission test procedure for operating micro fuel cell power system	142
Figure C.1 – General block diagram of a reformed methanol micro fuel cell power system – Replaces Figure 1	146
Figure C.10 – Operational emission rate testing apparatus – Replaces Figure 10	150
Figure C.11 – Operational emission concentration testing apparatus – Replaces Figure 11	151
Figure C.12 – Hydrogen emission test procedure for operating micro fuel cell power system	156
Figure D.1 – Methanol clathrate compound micro fuel cell power system block diagram – Replaces Figure 1	160
Figure D.2 – Fuel cartridge leakage and mass loss test flow chart for pressure differential, vibration, drop, and compressive loading tests – Replaces Figure 2	166
Figure D.3 – Fuel cartridge leakage and mass loss test flow chart for temperature cycling test and high temperature exposure test – Replaces Figure 3	167
Figure D.4 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for pressure differential, vibration, temperature cycling, drop and compressive loading tests – Replaces Figure 4	168
Figure D.5 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for external short-circuit test – Replaces Figure 5	169
Figure D.9 – Fuel cartridge leakage and mass loss test flow chart for long-term storage test – Replaces Figure 9	180
Figure D.12 – Fuel cartridge of methanol clathrate compound	161
Figure D.13 – Usage of methanol clathrate compound with micro fuel cell power unit	161
Figure E.1 – Micro fuel cell power system block diagram for liquid Class 8 (corrosive) borohydride compound fuel with onboard fuel processing – Replaces Figure 1	184
Figure E.2 – Fuel cartridge leakage and hydrogen leakage and test flow chart for vibration, drop, compressive loading – Replaces Figure 2	199
Figure E.3 – Fuel cartridge leakage and mass loss hydrogen leakage test flow chart for temperature cycling test and high temperature exposure test – Replaces Figure 3	201
Figure E.4 – Micro fuel cell power system or micro fuel cell power unit leakage and mass hydrogen gas loss test flow chart for pressure differential, vibration, temperature cycling, drop and compressive loading tests – Replaces Figure 4	203
Figure E.5 – Micro fuel cell power system or micro fuel cell power unit leakage and mass hydrogen gas loss test flow chart for external short-circuit test – Replaces Figure 5	205
Figure E.6 – Micro fuel cell power system or micro fuel cell power unit leakage and mass hydrogen gas loss test flow chart for 68 kPa low external pressure test – Replaces Figure 6	206
Figure E.7 – Micro fuel cell power system or micro fuel cell power unit leakage and mass hydrogen gas loss test flow chart for 11,6 kPa low external pressure test – Replaces Figure 7	207
Figure E.8 – Temperature cycling – Replaces Figure 8	213
Figure E.9 – Fuel cartridge hydrogen leakage and mass loss test flowchart for long-term storage test – Replaces Figure 9	220

Figure E.10 – Operational emission rate testing apparatus – Replaces Figure 10	230
Figure E.11 – Operational emission concentration testing apparatus – Replaces Figure 11	231
Figure E.12 – Hydrogen emission test procedure for operating micro fuel cell power system – Replaces Figure 12.....	237
Figure E.13 – Micro fuel cell power system block diagram for liquid Class 8 (corrosive) borohydride compound fuel with fuel cartridge fuel processing.....	185
Figure E.14 – Micro fuel cell power system block diagram for solid Class 8 (corrosive) borohydride compound fuel with fuel cartridge fuel processing and cartridge fuel management.....	186
Figure E.15 – Micro fuel cell power system block diagram for solid Class 8 (corrosive) compound fuel with cartridge fuel processing and fuel management internal to the micro fuel cell power unit	187
Figure E.16 – Fuel cartridge leakage test flow chart for low external pressure test.....	239
Figure F.1 – Borohydride micro fuel cell power system block diagram for Class 4.3 (water reactive) compound fuel in indirect borohydride fuel cell system; fuel management in micro fuel cell power unit – Replaces Figure 1	243
Figure F.2 – Fuel cartridge leakage and hydrogen leakage test flow chart for pressure differential, vibration, drop, and compressive loading tests – Replaces Figure 2	257
Figure F.3 – Fuel cartridge leakage and mass loss hydrogen leakage test flow chart for temperature cycling test and high temperature exposure test – Replaces Figure 3.....	259
Figure F.4 – Micro fuel cell power system or micro fuel cell power unit leakage and mass hydrogen gas loss test flow chart for pressure differential, vibration, temperature cycling, drop and compressive loading tests – Replaces Figure 4	261
Figure F.5 – Micro fuel cell power system or micro fuel cell power unit leakage and mass hydrogen gas loss test flow chart for external short-circuit test – Replaces Figure 5	263
Figure F.6 – Micro fuel cell power system or micro fuel cell power unit leakage and mass hydrogen gas loss test flow chart for 68 kPa low external pressure test – Replaces Figure 6.....	264
Figure F.7 – Micro fuel cell power system or micro fuel cell power unit leakage and mass hydrogen gas loss test flow chart for 11,6 kPa low external pressure test – Replaces Figure 7.....	265
Figure F.8 – Temperature cycling – Replaces Figure 8	271
Figure F.9 – Fuel cartridge hydrogen leakage and mass loss test flow chart for long-term storage test – Replaces Figure 9	278
Figure F.10 – Operational emission rate testing apparatus – Replaces Figure 10	288
Figure F.11 – Operational emission concentration testing apparatus – Replaces Figure 11	288
Figure F.12 – Borohydride micro fuel cell power system block diagram for Class 4.3 (water reactive) compound fuel in indirect borohydride fuel cell system; fuel management in fuel cartridge.....	244
Figure F.13 – Hydrogen emission test procedure for operating micro fuel cell power system.....	295
Figure F.14 – Fuel cartridge leakage test flow chart for low external pressure test.....	297
Figure G.1 – Direct borohydride micro fuel cell power system block diagram – Replaces Figure 1.....	300
Figure G.2 – Fuel cartridge leakage test flow chart for pressure differential, vibration, drop, and compressive loading tests – Replaces Figure 2.....	311

Figure G.3 – Fuel cartridge leakage and mass loss test flow chart for temperature cycling test and high temperature exposure test – Replaces Figure 3	312
Figure G.4 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss flow chart for pressure differential, vibration, temperature cycling, drop, and compressive loading tests – Replaces Figure 4.....	313
Figure G.5 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for external short-circuit test – Replaces Figure 5	314
Figure G.6 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for 68 kPa low external pressure test – Replaces Figure 6.....	315
Figure G.7 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for 11,6 kPa low external pressure test – Replaces Figure 7.....	316
Figure G.8 – Temperature cycling – Replaces Figure 8.....	322
Figure G.9 – Fuel cartridge hydrogen leakage and mass loss test flow chart for long-term storage test – Replaces Figure 9	327
Figure G.10 – Operational emission rate testing apparatus – Replaces Figure 10.....	336
Figure G.11 – Operational emission concentration testing apparatus – Replaces Figure 11	337
Figure G.12 – Hydrogen emission test procedure for operating micro fuel cell power system.....	344
Figure G.13 – Fuel cartridge leakage test flow chart for low external pressure test	317
Figure H.1 – Butane solid oxide micro fuel cell power system block diagram – Replaces Figure 1.....	347
Figure H.2 – Fuel cartridge leakage and mass loss test flow chart for vibration, drop and compressive loading tests – Replaces Figure 2.....	354
Figure H.3 – Fuel cartridge leakage and mass loss test flow chart for temperature cycling test and high temperature exposure test – Replaces Figure 3	355
Figure H.4 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for pressure differential, vibration, temperature cycling, drop and compressive loading tests – Replaces Figure 4.....	356
Figure H.5 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for external short-circuit test – Replaces Figure 5	357
Figure H.6 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for 68 kPa low external pressure test – Replaces Figure 6.....	358
Figure H.7 – Micro fuel cell power system or micro fuel cell power unit leakage and mass loss test flow chart for 11,6 kPa low external pressure test – Replaces Figure 7.....	359
Figure H.8 – Temperature cycling – Replaces Figure 8.....	365
Figure H.9 – Fuel cartridge leakage and mass loss test flow chart for long-term storage test – Replaces Figure 9	372
Figure H.10 – Operational emission rate testing apparatus – Replaces Figure 10.....	377
Figure H.11 – Operational emission concentration testing apparatus	378
Table 1 – Summary of material flammability requirements.....	23
Table 2 – Temperature limits	28
Table 3 – Limits for inherently limited power sources	29
Table 4 – Limits for power sources not inherently limited (Over-current protection required).....	30

Table 5 – List of type tests	37
Table 6 – Laboratory standard conditions	38
Table 7 – Emission limits	64
Table A.5 – List of type tests – Replaces Table 5.....	69
Table A.6 – Laboratory standard conditions – Replaces Table 6	70
Table A.7 – Emission limits – Replaces Table 7	94
Table A.8 – Occupational exposure limits	94
Table B.5 – List of type tests – Replaces Table 5.....	106
Table B.6 – Laboratory standard conditions – Replaces Table 6	107
Table B.7 – Emission limits – Replaces Table 7	143
Table C.5 – List of type tests – Replaces Table 5	149
Table C.6 – Laboratory standard conditions – Replaces Table 6	150
Table C.7 – Emission limits – Replaces Table 7	157
Table C.8 – Occupational exposure limits	157
Table D.5 – List of type tests – Replaces Table 5	164
Table D.6 – Laboratory standard conditions – Replaces Table 6	165
Table E.5 – List of type tests – Replaces table 5.....	195
Table E.6 – Laboratory standard conditions – Replaces Table 6	196
Table E.7 – Emission limits – Replaces Table 7	236
Table F.5 – List of type tests – Replaces Table 5.....	252
Table F.6 – Laboratory standard conditions – Replaces Table 6	253
Table F.7 – Emission limits – Replaces Table 7	294
Table G.5 – List of type tests – Replaces Table 5	308
Table G.6 – Laboratory standard conditions – Replaces Table 6.....	309
Table G.7 – Emission limits – Replaces Table 7	343
Table H.5 – List of type tests – Replaces Table 5	352
Table H.6 – Laboratory standard conditions – Replaces Table 6	353
Table H.7 – Emission Limits – Replaces Table 7	381
Table H.8 – Occupational exposure limits	382

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FUEL CELL TECHNOLOGIES –

Part 6-100: Micro fuel cell power systems –
Safety

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A vertical line in the margin shows where the base publication has been modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through.

International Standard IEC 62282-6-100 has been prepared by IEC technical committee 105: Fuel cell technologies

This standard cancels and replaces IEC/PAS 62282-6-1 published in 2006. This first edition constitutes a technical revision.

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

How to use this standard:

The subclauses and clauses of the main body of the text are modified, replaced or applied as they are in each of the annexes, which applies to a different technology. Instructions are written in *Italic type*.

- a) For the methanol, and methanol and water fuels covered by Clauses 1 through 7, all requirements are given in Clauses 1 through 7 and the annexes should not be used for these fuels.
- b) For the specific fuels and technologies covered by Annexes A through H, each annex outlines the additional or modified requirements with respect to the requirements contained in Clauses 1 through 7 for certification of such micro fuel cell power systems, micro fuel cell power units and their respective fuel cartridges covered by the specific annex.
- c) Where possible, the numbering system of the annexes corresponds to the numbering of Clauses 1 through 7 and their subclauses. Requirements from Clauses 1 through 7 and their subclauses not specifically addressed in an annex apply to the fuels and technologies covered by that particular annex as written in Clauses 1 through 7.
- d) Where an annex gives specific subclause direction – preceded by the annex letter designator – those specific subclauses in the annex reflect the additional or modified requirements for the fuels and technologies covered by the particular annex and shall be followed for that annex. Any additional subclauses have been assigned new numbers and shall be followed.
- e) Modified or replacement figures or tables have been given modified table or figure designators – based on the figure or table number in Clauses 1 through 7 preceded by the annex letter designator. New figures or tables in the annexes have been given new figure or table designators and shall also be used.

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FUEL CELL TECHNOLOGIES –

Part 6-100: Micro fuel cell power systems – Safety

1 Scope

1.1 General

- a) This consumer safety standard covers micro fuel cell power systems, micro fuel cell power units and fuel cartridges that are wearable or easily carried by hand, providing d.c. outputs that do not exceed 60 V d.c. and power outputs that do not exceed 240 VA. Portable fuel cell power systems that provide output levels that exceed these electrical limits are covered by IEC 62282-5-1.
- b) Externally accessible circuitry is therefore considered to be safety extra low voltage (SELV) circuitry as defined in IEC 60950-1:2005, and as limited power circuits if further compliance with 2.5 of IEC 60950-1:2005 is demonstrated. Micro fuel cell power systems or units that have internal circuitry exceeding 60 V d.c. or 240 VA should be appropriately evaluated in accordance with the separate criteria of IEC 60950-1:2005.
- c) This consumer safety standard covers all micro fuel cell power systems, micro fuel cell power units and fuel cartridges. This standard establishes requirements for all micro fuel cell power systems, micro fuel cell power units and fuel cartridges to ensure a reasonable degree of safety for normal use, reasonably foreseeable misuse, and consumer transportation of such items. The fuel cartridges covered by this standard are not intended to be refilled by the consumer. Fuel cartridges refilled by the manufacturer or by trained technicians shall meet all requirements of this standard.
- d) These products are not intended for use in hazardous areas as defined by IEC 60079-10-1.

1.2 Fuels and technologies covered

- a) A micro fuel cell power system block diagram is shown in Figure 1.
- b) All portions of this standard, including all annexes, apply to micro fuel cell power systems, micro fuel cell power units and fuel cartridges as defined in Subclause 1.1 above.
- c) Clauses 1 through 7 of this standard cover direct methanol fuel cells using methanol or methanol and water solutions as fuel. Clauses 1 through 7 cover specific requirements for direct methanol fuel cells using proton exchange membrane technologies. Clauses 1 through 7 also cover general requirements applicable to all fuel cell technologies and all fuels covered in Annexes A through H.
- d) Annexes A through H cover fuels and fuel cell technologies as follows.
 - 1) Annex A covers micro fuel cell power systems, micro fuel cell power units and fuel cartridges that use formic acid in water solutions – that are comprised of less than 85 % formic acid by weight – as fuel. These systems and units use direct formic acid fuel cell technologies.
 - 2) Annex B covers micro fuel cell power systems, micro fuel cell power units and fuel cartridges that use hydrogen gas – that has been stored in a hydrogen absorbing metal alloy – as fuel. These systems and units use proton exchange membrane fuel cell technologies.
 - 3) Annex C covers micro fuel cell power systems, micro fuel cell power units and fuel cartridges that convert methanol or methanol and water solutions through a reformer into hydrogen rich methanol reformat – which is then immediately fed to the fuel cell or fuel cell stack – as fuel. These systems and units use proton exchange membrane fuel cell technologies.