



WORKING PAPER

**DANGEROUS GOODS PANEL (DGP)
MEETING OF THE WORKING GROUP OF THE WHOLE**

Abu Dhabi, United Arab Emirates, 7 to 11 November 2010

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2013/2014 Edition

2.4: Part 4 — Packing Instructions

2.8: Part 8 — Provisions Concerning Passengers and Crew

**FUEL CELL INDUSTRY UPDATE — INTERNATIONAL ELECTROTECHNICAL
COMMITTEE (IEC) 62282-6-100 INTERNATIONAL STANDARD FOR MICRO FUEL CELLS**

(Presented by USFCC)

SUMMARY

This paper provides an update on the adoption by the IEC of an International Standard for micro fuel cells and recommends to DGP-WG10 some follow-up action.

Action by the DGP-WG is in paragraph 2.

1. INTRODUCTION

1.1 The *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) make conformance to IEC Publicly Available Specification (PAS) 62282-6-1 mandatory for fuel cell systems, cartridges and fuel cell battery interaction under the provisions for dangerous goods carried by passengers or crew, Part 8;1.1.2 t). Similar requirements are also applicable to cargo transport on passenger aircraft of fuel cell cartridges and fuel cell systems when transported under packing instructions for fuel cell cartridges contained in equipment in Part 4 of the Technical Instructions.

1.2 Subsequent to the publication of IEC PAS 62282-6-1, the fuel cell industry worked through the IEC to develop IEC International Standard 62282-6-100. The standard was initially approved by the responsible IEC National Committee members, in accordance with relevant International Standards Organization (ISO)/IEC Directives, as a Committee Draft for Voting (CDV) and then as a Final Draft International Standard (FDIS). This was followed by the publication of International Standard 62282-6-100 by the IEC Central Office in 2010. In order to maintain continuity within the IEC standards for fuel cells, the IEC National Committee were requested to allow national adoption of IEC International Standard 62282-6-100 not before 1 January 2011.

2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to remove the citations in the *Technical Instructions* to IEC PAS 62282-6-1 and replace them with IEC International Standard 62282-6-100 in Part 8;1.1.2 t) 4) and t) 8), and in Part 4, Packing Instructions 216, 375, 496 and 874, for fuel cell cartridges contained in equipment.

2.2 At the time that references to IEC PAS 62282-6-1 are changed to IEC International Standard 62282-6-100, a transition period could be considered. The DGP-WG is invited to discuss a suitable transition period to allow industry to conform in an orderly manner to the new International Standard while allowing fuel cell units and cartridges built to IEC PAS 62282-6-1 to be transported without hindrance.

2.3 The DGP-WG is also invited to discuss how they wish to review IEC International Standard 62282-6-100 now that it is published as an International Standard.

APPENDIX

PROPOSED AMENDMENTS TO THE TECHNICAL INSTRUCTIONS

Part 4

PACKING INSTRUCTIONS

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Packing Instruction 216		
Passenger and cargo aircraft for UN 3478 and 3479 (contained in equipment) only		
General requirements		
Part 4;1.1.1 and 1.1.8 requirements must be met, including:		
1) Compatibility requirements		
— Substances must be compatible with their packagings as required by 4;1.1.3.		
<i>UN number and name</i>	<i>Quantity — passenger</i>	<i>Quantity — cargo</i>
UN 3478 Fuel cell cartridges contained in equipment , containing liquefied flammable gas	1 kg of fuel cell cartridges	15 kg of fuel cell cartridges
UN 3479 Fuel cell cartridges contained in equipment , containing hydrogen in metal hydride		
ADDITIONAL PACKING REQUIREMENTS		
— Fuel cell cartridges that are contained in equipment must be protected against short circuit and the equipment must be protected against inadvertent operation.		
— Equipment must be securely cushioned in the outer packagings.		
— Fuel cell systems must not charge batteries during transport.		
— On passenger aircraft, each fuel cell system and each fuel cell cartridge must conform to IEC PAS 62282-6-4 62282-6-100 Ed. 1 or a standard approved by the appropriate authority of the State of Origin.		
OUTER PACKAGINGS		
<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Strong outer packagings		

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Packing Instruction 375

Passenger and cargo aircraft for UN 3473 (contained in equipment) only

General requirements

Part 4;1.1.1 and 1.1.8 requirements must be met, including:

1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

<i>UN number and proper shipping name</i>	<i>Quantity — passenger</i>	<i>Quantity — cargo</i>
UN 3473 Fuel cell cartridges contained in equipment	5 kg of fuel cell cartridges	50 kg of fuel cell cartridges

ADDITIONAL PACKING REQUIREMENTS

- Fuel cell cartridges that are contained in equipment must be protected against short circuit and the equipment must be protected against inadvertent operation.
- Equipment must be securely cushioned in the outer packagings.
- Fuel cell systems must not charge batteries during transport.
- On passenger aircraft, each fuel cell system and each fuel cell cartridge must conform to IEC PAS-~~62282-6-4~~ [62282-6-100](#) Ed. 1 or a standard approved by the appropriate authority of the State of Origin.

OUTER PACKAGINGS

Boxes

Drums

Jerricans

Strong outer packagings

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Packing Instruction 496

Passenger and cargo aircraft for UN 3476 (contained in equipment) only

General requirements

Part 4;1.1.1 and 1.1.8 requirements must be met, including:

1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

<i>UN number and name</i>	<i>Quantity — passenger</i>	<i>Quantity — cargo</i>
UN 3476 Fuel cell cartridges contained in equipment , containing water-reactive substances	5 kg of fuel cell cartridges	50 kg of fuel cell cartridges

ADDITIONAL PACKING REQUIREMENTS

- Fuel cell cartridges that are contained in equipment must be protected against short circuit and the equipment must be protected against inadvertent operation.
- Equipment must be securely cushioned in the outer packagings.
- The mass of each fuel cell cartridge must not exceed 1 kg.
- Fuel cell systems must not charge batteries during transport.
- On passenger aircraft, each fuel cell system and each fuel cell cartridge must conform to IEC PAS-~~62282-6-4~~ [62282-6-100](#) Ed. 1 or a standard approved by the appropriate authority of the State of Origin.

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Drums

Jerricans

Strong outer packagings

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Packing Instruction 874

Passenger and cargo aircraft for UN 3477 (contained in equipment) only

General requirements

Part 4;1.1.1 and 1.1.8 requirements must be met, including:

1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

<i>UN number and name</i>	<i>Quantity — passenger</i>	<i>Quantity — cargo</i>
UN 3477 Fuel cell cartridges contained in equipment , containing corrosive substances	5 kg of fuel cell cartridges	50 kg of fuel cell cartridges

ADDITIONAL PACKING REQUIREMENTS

- Fuel cell cartridges that are contained in equipment must be protected against short circuit and the equipment must be protected against inadvertent operation.
- Equipment must be securely cushioned in the outer packagings.
- The mass of each fuel cell cartridge must not exceed 1 kg.
- Fuel cell systems must not charge batteries during transport.
- On passenger aircraft, each fuel cell system and each fuel cell cartridge must conform to IEC PAS ~~62282-6-4~~ [62282-6-100](#) Ed. 1 or a standard approved by the appropriate authority of the State of Origin.

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Drums

Jerricans

Strong outer packagings

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Part 8

PROVISIONS CONCERNING PASSENGERS AND CREW

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Chapter 1

PROVISIONS FOR DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

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Consumer articles

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- ≠ t) fuel cells used to power portable electronic devices (for example cameras, cellular phones, laptop computers and camcorders) and spare fuel cell cartridges, under the following conditions:

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For hydrogen in metal hydride, the fuel cell cartridges must have a water capacity of 120 mL or less;

- | 4) each fuel cell and each fuel cell cartridge must conform to IEC PAS-~~62282-6-1~~ [62282-6-100](#) Ed. 1, and must be marked with a manufacturer's certification that it conforms to the specification. In addition, each fuel cell cartridge must be marked with the maximum quantity and type of fuel in the cartridge;

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- | 8) interaction between fuel cells and integrated batteries in a device must conform to IEC PAS-~~62282-6-1~~ [62282-6-100](#) Ed. 1. Fuel cells whose sole function is to charge a battery in the device are not permitted;

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