



WORKING PAPER

**DANGEROUS GOODS PANEL (DGP)
WORKING GROUP MEETING (DGP-WG/15)**

Montreal, 27 April to 1 May 2015

Agenda Item 5: Development of mitigating measures to address risks associated with the transport of lithium batteries including measures that address recommendations from the Second International Multidisciplinary Lithium Battery Transport Coordination Meeting

5.6: Miscellaneous lithium battery issues

SMALL LITHIUM METAL CELLS AND BATTERIES

(Presented by PRBA – The Rechargeable Battery Association and National Electrical Manufacturers Association (NEMA))

SUMMARY

This working paper proposes a new special provision assigned to UN 3090 — **Lithium metal batteries** and an amendment to the name field of the dangerous goods list (Table 3-1 of the Technical Instructions) for this entry as shown in the appendix to this working paper to account for small lithium metal button cells with no more than 0.3 grams of lithium metal and lithium metal cells and batteries designed exclusively for use in medical applications.

Action by the DGP-WG: The DGP-WG is invited to consider a new special provision and amendment to the UN 3090 — **Lithium metal batteries** entry in the dangerous goods list (Table 3-1 of the Technical Instructions).

1. INTRODUCTION

1.1 The DGP has discussed on a number of occasions limiting the use of overpacks for Section II lithium ion and lithium metal cells and batteries packaged in accordance with Packing Instructions 965 and 968. PRBA and NEMA believe that such limitations are a reasonable approach to address the transport of larger shipments of Section II cells and batteries. However, PRBA and NEMA also believe that very small lithium ion and lithium metal cells and batteries should be exempt from any new overpack limitations adopted by the DGP. This paper specifically addresses the issues associated with lithium metal button cells with no more than 0.3 grams of lithium metal and small lithium metal cells and batteries manufactured exclusively for use in medical applications. Information on small lithium ion cells and batteries will be presented at a later date.

1.2 Test data on lithium metal button cells presented during the Second International Multidisciplinary Lithium Battery Transport Coordination Meeting in Cologne, Germany from 9 to 11 September 2014 showed that these small cells do not create high temperatures or propagate when subjected to tests similar to those conducted by the United States Federal Aviation Administration (FAA). The cell [test data](#) and packaging [test data](#) are available for review on ICAO's website.

1.3 Small lithium metal cells and batteries (≤ 1 g Li metal/cell and ≤ 2 g Li metal/battery) designed exclusively for use in life-saving medical devices are subject to very rigorous national and international testing standards. More importantly, because of the high costs associated with manufacturing these cells and batteries, they are not packaged and shipped in large quantities like consumer-type lithium metal cells and batteries. Examples of the types of cells and batteries designed for use in medical devices and the packaging used to transport them are shown in Figure 1 and Figure 2. PRBA and NEMA believe these low-volume shipments do not present a significant risk in transport and thus should not be subject to any additional restrictions when shipped by air.

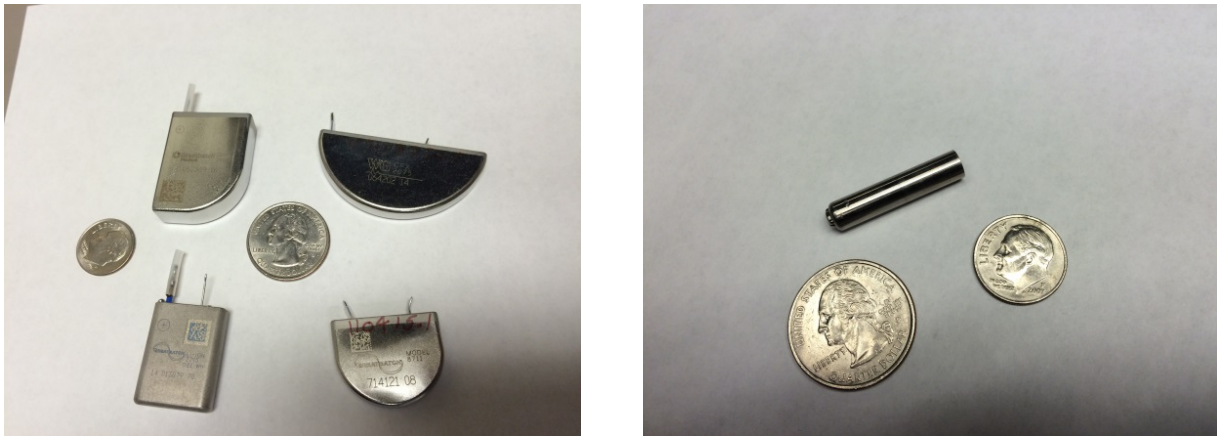


Figure 1. Samples of medical device cells



Figure 2. Example of packaging for medical device cells and batteries

1.4 In order to preserve a rational regulatory scheme for lithium metal button cells and small lithium metal cells and batteries (≤ 1 g Li metal/cell and ≤ 2 g Li metal/battery) designed exclusively for use in medical applications, PRBA and NEMA are proposing a new special provision and amendment to the entry for UN 3090 — **Lithium metal batteries** in the dangerous goods list as shown in the appendix to this working paper. The special provision and amended entry would maintain the existing regulatory requirements for lithium metal button cells with no more than 0.3 grams of lithium metal and small lithium metal cells and batteries designed for use in medical devices.

1.5 The PRBA and NEMA proposed amendment for the UN 3090 — **Lithium metal batteries** entry is very similar to that provided for UN 3508 — **Capacitor, asymmetric** and UN 3499 — **Capacitor, electric double layer** with an energy storage capacity of no more than 0.3 Wh. However, while small capacitors are provided a blanket exemption from the Technical Instructions, lithium metal button cells and medical device cells and batteries would still be subject to UN testing, packaging, labelling and documentation requirements.

2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to consider the following new special provision and amendments to the entry for UN 3090 — **Lithium metal batteries** in the dangerous goods list as shown in the appendix to this working paper.

APPENDIX

PROPOSED AMENDMENT TO PART 3 OF THE TECHNICAL INSTRUCTIONS

Part 3

DANGEROUS GOODS LIST,
SPECIAL PROVISIONS AND
LIMITED AND EXCEPTED QUANTITIES

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Chapter 2

ARRANGEMENT OF THE
DANGEROUS GOODS LIST (TABLE 3-1)

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Table 3-1. Dangerous Goods List

Name 1	UN No. 2	Class or division 3	Subsidiary risk 4	Labels 5	State variations 6	Special provisions 7	UN packing group 8	Excepted quantity 9	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction 10	Max. net quantity per package 11	Packing instruction 12	Max. net quantity per package 13
...												
Lithium metal batteries (including lithium alloy batteries) † <u>Lithium metal button cells and lithium metal cells and batteries designed for use only in medical device, see Special Provision Axxx.</u>	3090	9		Miscellaneous	US 2 US 3	A88 A99 A154 A164 A183 A201 <u>Axxx</u>		E0	FORBIDDEN		See 968	
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Chapter 3

SPECIAL PROVISIONS

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Table 3-2. Special provisions

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AXXX

Lithium metal button cells and with no more than 0.3 g of lithium metal and lithium metal cells and batteries designed exclusively for use in medical applications with no more than 1 g lithium metal per cell and no more than 2 g lithium metal per battery when carried as cargo are not subject to other requirements of these Instructions if they meet all of the following conditions:

- a) The provisions of Part 7:4.4 (Reporting of dangerous goods accidents and incidents) apply;
- b) The provisions of 2:9.3.1 a) and e) apply;
- c) Cells and batteries must be packed in inner packagings that completely enclose the cell then placed in a strong outer packaging; the strong outer packaging must conform to Part 4:1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1);
- d) Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit;
- e) Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
 - 1) damage to cells or batteries contained therein;
 - 2) shifting of the contents so as to allow cell to cell or battery to battery contact;
 - 3) release of contents.
- f) Each package must be labelled with a lithium battery handling label (Figure 5-32). The label must be marked with "UN 3090 AXXX" and the cargo aircraft only label (Figure 5-26). The cargo aircraft only label must be located on the same surface of the package near the lithium battery handling label, if the package dimensions are adequate.
- g) The maximum net quantity (mass) per package must not exceed 2.5 kg.
- h) The words "lithium metal batteries, in compliance with Special Provision AXXX" must be placed on the air waybill, when an air waybill is used.
- i) Consignments of lithium metal cells or batteries prepared in accordance with this special provision must not be consolidated with other shipments of dangerous goods or non-dangerous goods and must not be loaded into a unit load device before being offered to the operator;
- j) Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities; and
- k) When packages are placed in an overpack, the lithium battery handling label required by this special provision must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

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