



---

## Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

### Sub-Committee of Experts on the Transport of Dangerous Goods

#### Fifty-ninth session

Geneva, 29 November – 8 December 2021

Item 4 (f) of the provisional agenda

Electric storage systems: miscellaneous

## Provisions of 2.9.4 for lithium batteries transported under special provision 310

Transmitted by the expert from Belgium\*

### Introduction

1. Several discussions related to the transport by air in a working group of the dangerous goods expert group (Dangerous Goods European Liaison Group) of the European Union Aviation Safety Agency (EASA) and a working group of the dangerous goods panel of the International Civil Aviation Organisation (ICAO) demonstrated that it was unclear which provisions of 2.9.4 must always be met when lithium batteries are offered for transport.

### Discussion

2. Cells and batteries, cells and batteries contained in equipment, or cells and batteries packed with equipment, containing lithium in any form shall be assigned to UN Nos. 3090, 3091, 3480 or 3481 as appropriate. They may be transported under these entries if they meet the following provisions of 2.9.4:

*"(a) Each cell or battery is of the type proved to meet the requirements of each test of the Manual of Tests and Criteria, Part III, sub-section 38.3;*

*(b) Each cell and battery incorporates a safety venting device or is designed to preclude a violent rupture under conditions normally incident to transport;*

*(c) Each cell and battery is equipped with an effective means of preventing external short circuits;*

*(d) Each battery containing cells or series of cells connected in parallel is equipped with effective means as necessary to prevent dangerous reverse current flow (e.g., diodes, fuses, etc.);*

---

\* A/75/6 (Sect.20), para. 20.51.

(e) *Cells and batteries shall be manufactured under a quality management programme that includes:*

- (i) *A description of the organizational structure and responsibilities of personnel with regard to design and product quality;*
- (ii) *The relevant inspection and test, quality control, quality assurance, and process operation instructions that will be used;*
- (iii) *Process controls that should include relevant activities to prevent and detect internal short circuit failure during manufacture of cells;*
- (iv) *Quality records, such as inspection reports, test data, calibration data and certificates. Test data shall be kept and made available to the competent authority upon request;*
- (v) *Management reviews to ensure the effective operation of the quality management programme;*
- (vi) *A process for control of documents and their revision;*
- (vii) *A means for control of cells or batteries that are not conforming to the type tested as mentioned in (a) above;*
- (viii) *Training programmes and qualification procedures for relevant personnel; and*
- (ix) *Procedures to ensure that there is no damage to the final product.*

(f) *Lithium batteries, containing both primary lithium metal cells and rechargeable lithium ion cells, that are not designed to be externally charged (see special provision 387 of Chapter 3.3) shall meet the following conditions:*

- (i) *The rechargeable lithium ion cells can only be charged from the primary lithium metal cells;*
- (ii) *Overcharge of the rechargeable lithium ion cells is precluded by design;*
- (iii) *The battery has been tested as a lithium primary battery;*
- (iv) *Component cells of the battery shall be of a type proved to meet the respective testing requirements of the Manual of Tests and Criteria, part III, sub-section 38.3.*

(g) *Manufacturers and subsequent distributors of cells or batteries manufactured after 30 June 2003 shall make available the test summary as specified in the Manual of Tests and Criteria, Part III, sub-section 38.3, paragraph 38.3.5."*

3. However, several special provisions are assigned to these UN numbers which indicate more precisely which of the provisions of 2.9.4 must be met under which conditions:

(a) Special provision 188 is assigned to UN Nos. 3090, 3091, 3480 and 3481. Sub-paragraph (c) of this special provision 188 states the following:

*"(c) Each cell or battery meets the provisions of 2.9.4 (a), (e), (f) if applicable and (g);"*

(b) Special provision 230 is assigned to UN Nos. 3090, 3091, 3480 and 3481. It states the following:

*"230 Lithium cells and batteries may be transported under this entry if they meet the provisions of 2.9.4."*

(c) Special provision 310 is assigned to UN Nos. 3090, 3091, 3480 and 3481. The first paragraph of this special provision 310 states the following:

*"310 The testing requirements in the Manual of Tests and Criteria, part III sub-section 38.3 do not apply to production runs, consisting of not more than 100 cells or batteries, or to pre-production prototypes of cells or*

*batteries when these prototypes are transported for testing when packaged in accordance with packing instruction P910 of 4.1.4.1 or LP905 of 4.1.4.3, as applicable."*

4. For lithium cells or batteries offered for transport under special provision 310 it is not specifically indicated in this special provision which of the provisions of 2.9.4 do not have to be met. Only a general statement "The testing requirements in the Manual of Tests and Criteria, part III sub-section 38.3 do not apply" is included.

5. Although only provision 2.9.4 (a) clearly mentions the 38.3 testing requirements, the following provisions also implicitly mention the 38.3 testing requirements:

2.9.4 (e) (vii),

2.9.4 (f) (iii) if applicable,

2.9.4 f (iv) if applicable and

2.9.4 (g).

Therefore, Belgium believes that the provisions 2.9.4 (a), (e) (vii), (f) (iii) if applicable, f (iv) if applicable and (g) do not need to be met for lithium cells or batteries offered for transport under special provision 310. As a consequence, all the remaining provisions of 2.9.4 must always be met.

6. Additionally, Belgium believes that any lithium cell or battery that is offered for transport must always meet all the provisions of 2.9.4. Only when a cell or battery is offered for transport under special provision 310 the provisions of 2.9.4 listed in paragraph 5 of this document must not be met. If lithium cells or batteries do not meet the provisions of 2.9.4, transport of these cells and batteries is forbidden.

7. This would imply for example that a battery that does not have a safety venting device or a design to preclude a violent rupture or an effective means of preventing external short circuits is forbidden for transport.

8. The Sub-Committee is requested to confirm the interpretation in paragraph 6 of this document. The Sub-Committee is also invited to consider a clarification in special provision 310 as follows.

## **Proposal**

9. If the Sub-Committee agrees with the interpretation in paragraph 6 above, it is proposed to insert the following text to special provision 310 (new text is underlined):

"310 The testing requirements in the Manual of Tests and Criteria, part III sub-section 38.3 do not apply to production runs, consisting of not more than 100 cells or batteries, or to pre-production prototypes of cells or batteries when these prototypes are transported for testing when packaged in accordance with packing instruction P910 of 4.1.4.1 or LP905 of 4.1.4.3, as applicable.

Cells and batteries shall meet the provisions of 2.9.4 with the exception of 2.9.4 (a), 2.9.4 (e) (vii), 2.9.4 (f) (iii) if applicable, 2.9.4 f (iv) if applicable and 2.9.4 (g).

The transport document shall include the following statement: "Transport in accordance with special provision 310"."