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 **18 June 2024**

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Item 4 (b) of the provisional agenda
Electric storage systems:
Hazard-based system for classification of lithium batteries

New identification system – lithium cells and batteries – additional and consequential amendments

Transmitted by the expert from the United Kingdom

I. Introduction.

1. Within informal documents INF.27 and INF.28 the expert from the United Kingdom makes proposals for additions to the Dangerous Goods List, new special provisions and packing instructions. This informal document provides additional and consequential amendments because of the new identification system.

II. Marking and labelling.

2. In order to bind the new identifications to the cell or battery in question, marking and labelling is critical and provides the key for the complete simplification of all subsequent lithium cell or battery transport activities.

3. At present the requirement to mark the watt-hour rating of a battery on its case is found in special provision 188 (b) (but only for batteries subject to SP188) and in special provision 348. This provision is only applied to the 'Ion' battery entries although it is phrased, as 'Lithium Batteries' and would therefore appear to be targeted at all lithium batteries and by extension to cells. However, SP188 (a) deals explicitly with cells and does not include the marking requirements for batteries so it is unclear if the marking requirement applies to cells.

III. Proposals

Proposal 1

4. The following proposals are therefore made for inclusion within the *Manual of Tests and Criteria* after the newly proposed addition of sub-section 38.3.7 made in ST/SG/AC.10/C.3/2024/13 (new text in **bold**):

"38.3.8 Marking of cells and batteries (that have been classified in accordance with 38.3.6.)

38.3.8.1 Cells

38.3.8.1.1 Lithium-ion cells (that have passed all the tests) shall be marked in sequence with their Wh rating (fully charged), the classification division (fully charged) and where an additional test has been done at a reduced state of charge with the % of the reduced state of charge and the resultant classification division. For example, '5Wh C30G', where 'C' is the fully charged classification division, '30' is the reduced state of charge percentage and 'G' is the resultant classification division when tested at the reduced state of charge.

38.3.8.1.2 Lithium metal cells may be marked with the grammage of lithium but shall be marked with the classification division in full. For example, '0.8g 9D' or for example '9D'.

38.3.8.2 Batteries

38.3.8.2.1 By default, batteries that have not been tested comprising only of cells marked in accordance with 38.3.8.1 shall be marked with the most severe cell classification division contained therein, following the Wh rating mark. Where the battery comprises of only one type of cell that has also been tested at a reduced state of charge this additional classification division shall also be shown on the battery

38.3.8.2.2 Where an ion battery classification division is obtained from testing then following the Wh rating the battery, '100' shall be marked (denoting 100% state of charge), followed by the appropriate classification division. Batteries subsequently tested at a reduced state of charge will also be marked with the reduced state of charge and the classification division. For example, 50Wh 100C50H This classification takes precedence over any default classification divisions."

Proposal 2

5. New requirements for damaged and defective lithium cells and batteries should be communicated at the end of 2.9.4 as a new sub paragraph (h) within the *Model Regulations*. This is as follows (new text in **bold**):

"2.9.4 (h) Damaged and defective lithium cells and batteries shall be transported under the requirements of the fully charged division assigned to the cell or battery unless a lower state of charge division has been assigned[,][and] can be demonstrated [and in no circumstances is less than a 30% state of charge].

Cells and batteries that have been assigned a classification under the Manual of Tests and Criteria 38.3.5 and 38.3.6 tests, and are marked accordingly, shall only be transported according to the relevant provisions given for the division and identification in the Dangerous Goods list of 3.2.1."

Proposal 3

6. There is also the need to clarify the position in relation to limited quantities in Chapter 3.2.1 relevant to lithium batteries. The following proposals are made for inclusion within the *Model Regulations* immediately after the current Column 7a text (new text in **bold**):

"For lithium alloy or metal cells or articles containing a cell, the limited quantity is the aggregate lithium content. For ion cells or articles containing a cell the limited quantity is the fully charged watt-hour rating. For lithium alloy or metal batteries or articles containing a battery, the limited quantity is the lithium content. For ion batteries or articles containing a battery, the limited quantity is the fully charged watt-hour rating."

Proposal 4

7. As the proposals are introducing limited quantities for lithium batteries there is also a need to add to the provisions for packing in limited quantities in Chapter 3.4. The following proposals are to the *Model Regulations* specifically the third sentence in 3.4.2 (new text in **bold**):

"The use of inner packagings is not necessary for the transport of articles such as aerosols, **lithium metal or ion cells or batteries in divisions E, F, G or H** or "receptacles, small, containing gas"."

Proposal 5

8. Amend the first paragraph of packing instruction P909 within 4.14.1 as follows (new text in **bold**, redacted text ~~struck through~~):

"This instruction applies to UN numbers 3090, 3091, 3480, 3481, 3551, ~~and~~ 3552 **and 4024** transported for disposal or recycling…"

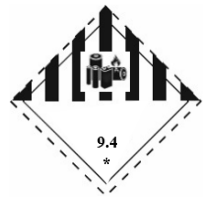
Proposal 6

9. The following proposals are made for inclusion within the *Model Regulations* immediately after the current 5.4.1.4.3(f) (new text in **bold**):

"5.4.1.4.3 (g) Damaged or defective lithium cells, batteries, or articles containing lithium cells or batteries: The word DAMAGED or the word DEFECTIVE shall immediately precede the proper shipping name."

Proposal 7

10. The following new row is proposed for addition at the end of the table in 5.2.2.2.2 of the *Model Regulations* (new text in **bold**):

Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 9: Miscellaneous dangerous substances and articles, including environmentally hazardous substances						
9A	-	7 vertical stripes in upper half: black; battery group, one broken and emitting flame in lower half: black	White	9 underlined (black)		-
9.4	**All divisions**	**7 vertical stripes in upper half inset white rectangle with battery group, one broken and emitting flame**	**White**	**9.4 (Black)**		*** Place for division label**

UN/SCETDG/64/INF.29

Proposal 8

1. Add to the alphabetical index the following entries at the appropriate places:

ARTICLE CONTAINING LITHIUM ION BATTERY non-integral	**9.4A**	**4071**
	9.4B	**4072**
	9.4C	**4073**
	9.4D	**4074**
	9.4E	**4075**
	9.4F	**4076**
	9.4G	**4077**
	9.4H	**4078**
ARTICLE CONTAINING LITHIUM METAL BATTERY non-integral	**9.4A**	**4079**
	9.4B	**4080**
	9.4C	**4081**
	9.4D	**4082**
	9.4E	**4083**
	9.4F	**4084**
	9.4G	**4085**
	9.4H	**4086**
ARTICLE WITH INTEGRATED LITHIUM ION BATTERY	**9.4A**	**4088**
	9.4B	**4089**
	9.4C	**4090**
	9.4D	**4091**
	9.4E	**4092**
	9.4F	**4093**
	9.4G	**4094**
	9.4H	**4095**
ARTICLE WITH INTEGRATED LITHIUM METAL BATTERY	**9.4A**	**4096**
	9.4B	**4097**
	9.4C	**4098**
	9.4D	**4099**
	9.4E	**4100**
	9.4F	**4101**
	9.4G	**4102**
	9.4H	**4103**
ARTICLE WITH INTEGRATED LITHIUM ION CELL	**9.4A**	**4055**
	9.4B	**4056**
	9.4C	**4057**
	9.4D	**4058**
	9.4E	**4059**
	9.4F	**4060**
	9.4G	**4061**
	9.4H	**4062**
ARTICLE WITH INTEGRATED LITHIUM METAL CELL	**9.4A**	**4063**
	9.4B	**4064**
	9.4C	**4065**
	9.4D	**4066**
	9.4E	**4067**
	9.4F	**4068**
	9.4G	**4069**
	9.4H	**4070**

EQUIPMENT CONTAINING LITHIUM ION BATTERY non-integral	**9.4A**	**4071**
	9.4B	**4072**
	9.4C	**4073**
	9.4D	**4074**
	9.4E	**4075**
	9.4F	**4076**
	9.4G	**4077**
	9.4H	**4078**
EQUIPMENT CONTAINING LITHIUM METAL BATTERY non-integral	**9.4A**	**4079**
	9.4B	**4080**
	9.4C	**4081**
	9.4D	**4082**
	9.4E	**4083**
	9.4F	**4084**
	9.4G	**4085**
	9.4H	**4086**
EQUIPMENT WITH INTEGRATED LITHIUM ION CELL	**9.4A**	**4055**
	9.4B	**4056**
	9.4C	**4057**
	9.4D	**4058**
	9.4E	**4059**
	9.4F	**4060**
	9.4G	**4061**
	9.4H	**4062**
EQUIPMENT WITH INTEGRATED LITHIUM METAL CELL	**9.4A**	**4063**
	9.4B	**4064**
	9.4C	**4065**
	9.4D	**4066**
	9.4E	**4067**
	9.4F	**4068**
	9.4G	**4069**
	9.4H	**4070**
LITHIUM BATTERY CONSISTING OF LITHIUM ION AND LITHIUM METAL CELLS Including lithium alloy	**9.4A**	**4041**
	9.4B	**4042**
	9.4C	**4043**
	9.4D	**4044**
	9.4E	**4045**
	9.4F	**4046**
	9.4G	**4047**
	9.4H	**4048**
LITHIUM CELLS AND BATTERIES FOR DISPOSAL, all types and categories	**9.4X**	**4024**
LITHIUM ION BATTERY Including lithium ion polymer Batteries	**9.4A**	**4025**
	9.4B	**4026**
	9.4C	**4027**
	9.4D	**4028**
	9.4E	**4029**
	9.4F	**4030**
	9.4G	**4031**
	9.4H	**4032**

LITHIUM ION BATTERY	**9.4C**	**4049**
REDUCED SOC	**9.4D**	**4050**
Including lithium ion polymer	**9.4E**	**4051**
Batteries	**9.4F**	**4052**
	9.4G	**4053**
	9.4H	**4054**
LITHIUM ION BUTTON CELL including lithium alloy	**9.4H**	**4016**
LITHIUM ION CELL	**9.4A**	**4000**
Including lithium ion polymer	**9.4B**	**4001**
cells	**9.4C**	**4002**
	9.4D	**4003**
	9.4E	**4004**
	9.4F	**4005**
	9.4G	**4006**
	9.4H	**4007**
LITHIUM ION CELL REDUCED	**9.4C**	**4018**
SOC Including lithium ion	**9.4B**	**4001**
polymer cells	**9.4D**	**4019**
	9.4E	**4020**
	9.4F	**4021**
	9.4G	**4022**
	9.4H	**4023**
LITHIUM METAL BATTERY	**9.4A**	**4033**
Including lithium alloy	**9.4B**	**4034**
batteries	**9.4C**	**4035**
	9.4D	**4036**
	9.4E	**4037**
	9.4F	**4038**
	9.4G	**4039**
	9.4H	**4040**
LITHIUM METAL BUTTON CELL	**9.4H**	**4017**
LITHIUM METAL CELL		
Including	**9.4A**	**4008**
lithium alloy cells	**9.4B**	**4009**
	9.4C	**4010**
	9.4D	**4011**
	9.4E	**4012**
	9.4F	**4013**
	9.4G	**4014**
	9.4H	**4015**
LITHIUM ION SOLID STATE	**9.4A**	**4120**
BATTERY	**9.4B**	**4121**