

Subject 2054

July 11, 2005

SUMMARY OF TOPICS

This following is being proposed:

Revisions to the Second Edition of the Standard for Safety for Household and Commercial Batteries which includes: a) revisions to paragraphs 5.1 and 5.2 and Table 6.2 that changes the name of the 250 lb Crush Test to 250 N Steady Force Test, b) revision to paragraph 9.3 that changes the temperature for the Short-Circuit Test from 60°C to 55°C, and c) revision to paragraph 23.3 that changes the time the oven is to remain at the final temperature from 30 minutes to 10 minutes.

ALL COMMENTS DUE: August 9, 2005

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~. In cases where renumbering has occurred no underlines or strikeouts are shown.

Revisions to the Second Edition of the Standard for Safety for Household and Commercial Batteries which includes: a) revisions to paragraphs 5.1 and 5.2 and Table 6.2 that changes the name of the 250 lb Crush Test to 250 N Steady Force Test, b) revision to paragraph 9.3 that changes the temperature for the Short-Circuit Test from 60°C to 55°C, and c) revision to paragraph 23.3 that changes the time the oven is to remain at the final temperature from 30 minutes to 10 minutes.

BACKGROUND

The second edition of UL 2054 was published on October 29, 2004.

RATIONALE

Revisions to the second edition of UL 2054 are being proposed to incorporate corrections to the second edition published on October 29, 2004. This edition was proposed in subject bulletins dated June 27, 2003, May 6, 2004, and August 11, 2004. The following summarizes the rationales for the revisions contained in the attached proposed new edition:

- a) Paragraphs 5.1 and 5.2 and Table 6.2 are being revised so the name of the 250 N Steady Force Test is consistent with the title of Section 19.
- b) Paragraph 9.3 is being revised so the temperature value for the Short-Circuit Test is consistent with the rest of the standard.
- c) Paragraph 23.3 is being revised so the temperature time is consistent with the same test in UL 1642, Standard for Lithium Batteries.

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PROPOSAL

5.1 Batteries are to be tested as described in Sections 9 through 24. Section 12, Forced-Discharge Test, is applicable only to cells intended to be used in multicell series applications, such as battery packs. The Battery Enclosure Tests, Sections 18 – 21 (including the ~~250 Lb. Crush~~ N Steady Force, Mold Stress Relief, and Drop Impact Tests) are intended only for batteries that have a plastic outer enclosure.

5.2 In most cases cells and/or batteries shall not explode or catch fire as a result of the tests in this standard. For the Shock Test, Section 16, Vibration Test, Section 17, ~~250 Lb. Crush~~ N Steady Force Test, Section 19, Mold Stress Relief Test, Section 20, Drop Impact Test, Section 21, and the Temperature Cycling Test, Section 24 the samples shall also not vent or leak. For these tests unacceptable leakage is deemed to have occurred when the resulting mass loss exceeds the values shown in Table 5.1, Venting and Leakage Mass Loss Criteria.

Table 6.2
Testing required for battery packs

Test	Section	Number of fully charged packs
Electrical Tests		
Short-Circuit	9	
at room temp.		5 (unsealed)
at 55°C (131°F)		5 (unsealed)
Abnormal Charge	10	5 (unsealed)
Abusive Overcharge	11	5 (unsealed)
Forced-Discharge ^a	12	5 (unsealed)
Limited Power Source	13	6 (unsealed)
Battery Enclosure Tests		
~~250 Lb. Crush~~ <u>250 N Steady Force</u>	19	3 (complete)
Mold Stress Relief	20	3 (complete)
Drop Impact	21	3 (complete)
Enclosure Flammability ^b	18	3 unsealed enclosures
NOTE – Unsealed refers to batteries which do not use securement such as adhesive and/or ultrasonic welding to seal the top and bottom enclosures in order to facilitate access to the inside of the battery pack. Complete refers to a whole sample of the battery pack representative of production.		
^a Forced Discharge test is conducted only for multi-cell series configurations.		
^b Enclosure materials classified as V-1 or less flammable in the minimum part thickness do not require enclosure flammability tests.		

9.3 Tests are to be conducted at $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$), and at ~~60~~ 55 $\pm 2^\circ\text{C}$ (~~140~~ 131 $\pm 3.6^\circ\text{F}$). The component cells are to reach equilibrium at $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$) or ~~60~~ 55 $\pm 2^\circ\text{C}$ (~~140~~ 131 $\pm 3.6^\circ\text{F}$) as applicable, before the terminals are connected.

23.3 The temperature of the oven is to be raised at a rate of $5 \pm 2^\circ\text{C}$ ($9 \pm 3.6^\circ\text{F}$) per minute to a temperature of $130 \pm 2^\circ\text{C}$ ($266 \pm 3.6^\circ\text{F}$) and remain at that temperature for ~~30~~ 10 minutes.

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