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November 2025

EUROBAT feedback on ANNEX to the Commission Delegated Regulation supplementing Regulation (EU) 2023/1542 of the European Parliament and of the Council as regards minimum values for the electrochemical performance and durability of rechargeable industrial batteries

Annex: List of core technical arguments and suggestions to change

As addressed during the stakeholders' consultation process in the Waste Expert Group meeting of 9 October 2025, we would like to address the following points in more detail:

Page/Clause	Comment	Suggested change
Page 1 sec 2(a)(3) & Page 3, sec 3.1.4	Energy round trip efficiency(RTE): 1. Different RTE thresholds should be set for products with different C-rate. Because different C-rates will result in different internal energy losses and RTE values. The recommendation is making standard classification according to common C-rate 1, 0.33, 0.25 The test environment and test conditions have a great influence on RTE results, that's why they need to be standardized.	Set different RTE thresholds for energy storage systems with different C-rate. If not, the RTE threshold should be adjust from 93% to 80% which is more available for energy storage systems with different using and testing condition
Page 1 sec 2(b)	It is assumed that the manufacturer will declare if a battery is REP or OND.	Add note in section 1 (4) and (5) to clarify that it is the manufacturer who **designs** and declares this
Page 1, sec 2(c)	For on demand batteries small UPS products may not meet the 12 year life requirement. These UPS systems typically use 7/9Ah batteries, which, when connected in	None but understand that this will result in a move to >12 year life battery in small UPS systems with unnecessary cost burden for end users as battery

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	series with 40/50 monoblocks, exceed 2kWh as a system.	life may exceed product service life.
Page 1, clause 2	For batteries that are residential energy storage systems and repetitive energy supply batteries: This wording is misleading. Repetitive energy supply batteries are covered by (b), whereas (a) covers residential energy storage systems which uses repetitive energy supply batteries.	Suggested new wording: (a) For batteries which are residential energy storage systems used as repetitive energy supply batteries.
Page 2 sec 2:	Batteries that are designed to be used as a repetitive energy supply battery and an on-demand battery shall comply with the requirements of a repetitive energy supply battery.	Suggested revision: Batteries designed for use both as a repetitive energy supply battery and as an OND battery shall comply with all applicable requirements for both categories to provide end user the information needed for correct product comparison and choice. Further discussion or revisions are recommended, as the current wording in the DA draft could inadvertently favour certain technologies over others.
Page 2 clause 3.1.1	Capacity fade ... shall be evaluated after at least 152 days or at least 350 FeqC	That contradicts reality of OND batteries and IEC60896-22 clause 6.13.2 table 17 where

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	That contradicts the reality of OND batteries and IEC 60896-22, clause 6.13.2, Table 17, which specifies that batteries should achieve between 20 and 120 FEqC depending on the reliability of the mains grid.	batteries should achieve depending on the reliability of the mains grid between 20 and 120 FEqC.
Page 3, sec 3.1.2	Clarify if 30% from usable energy capacity is from nominal capacity or peak capacity established in testing to En60896 21/22.	Redefine section1 (1) to state 'useable energy capacity' means the **maximum** energy available to the user when discharging a fully charged battery until the operation limit set by the battery management system or manufacturer; **through the life of the battery**
Page 2. sec 3.1.1 (a)	Is capacity fade after 350 FEqC, and using appropriate stress factors, used to predict **Expected lifetime in cycles** through linear trendline progression without the need to continue to the end of batteries service life?	Continue the test beyond 350 FEqC until capacity fade >10% for technology that does not follow a linear trendline progression
Page 2, sec 3.1.1 (b)	Is capacity fade after at least 152 days, and using appropriate stress factors, used to predict **Expected lifetime in years** through linear trendline progression without the need to continue to the end of batteries service life	Continue the test beyond 152 days until capacity fade > 5% for technology that does not follow a linear trendline progression
Page 3	The stress factors shall be calculated as follows:	The charge voltage is missing, although it has a significant impact on cycle life.

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	The charging voltage is missing, even though it has a significant impact on cycle life. Daily cycle testing according to IEC 60896-21 with 40% DoD and float voltage sometimes results in fewer cycles compared to cycle life testing under the predecessor standard IEC 60896-2 with 60% DoD and boost charging.	For REP batteries the stress factor has be amended by a stress factor, charge voltage.
Page 3, sec 3.2 Table 1	The stress factors quoted contradict those used in En60866 21/22.	Suggest a further row in Table 1 for ≥55°C with an SF in line with the standard. This SF > 10.5.
Page 1, sec 2 a) and b)	Misleading wording in a) may be interpreted as applicable for repetitive energy supply batteries <2kWh	For batteries which are residential energy storage systems used as repetitive energy supply batteries.
Page 2, sec 2 b) 2	This technology-agnostic approach harmonizes terminology and concepts across different battery technologies. For many use cases, the delegated act specifies minimum requirements for repetitive energy supply batteries that exceed the actual needs of the application. This will create a situation where, for example, in the cleaning machine sector—where lead batteries (including Gel and AGM) currently hold an 80% market share—these batteries will be prohibited, despite meeting the functional requirements of the application. Consequently, these state-of-the-art batteries, predominantly manufactured in Europe, will be removed	To better reflect real-life applications, we recommend distinguishing between Material Handling applications (no changes required) and Light Traction applications (e.g., cleaning machines). The minimum requirement for Light Traction applications should be set at 500 FEqC, which aligns with current market needs.

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<tr><th>Page/Clause</th><th>Comment</th><th>Suggested change</th></tr>
<tr><td></td><td>from the market and replaced by imported alternatives.</td><td></td></tr>
<tr><td>Page 4 Table 1</td><td>OND

Stress factor Ambient temperature

The stress factor proposed would place unreasonable expectations such as for LAB, therefore, should be corrected.

It is widely understood that operating at temperatures below the reference temperature (20 °C or 25 °C) does not extend life expectancy. Charge efficiency decreases as temperature decreases and can negatively affect life expectancy, even though the corrosion rate may also decline.

Based on scientific evidence (Arrhenius), the life expectancy of lead-based batteries decreases by 50% for every 10 K increase in temperature. Therefore, at 30 °C, the life expectancy is only half of that at 20 °C. However, in Table 1, the stress factor is listed as only “1.3.”</td><td>It is common understanding that operation at temperature below reference temperature (20 or 25°C) is not prolonging life expectancy.

Reference temperature has to be mentioned.

<table>
<tr><th>Reference temperature is 20°C $T_{Ambient}$ in °C</th><th>$SF_{T, OND}$</th></tr>
<tr><td>20</td><td>1</td></tr>
<tr><td>30</td><td>2</td></tr>
<tr><td>40</td><td>4</td></tr>
<tr><td>50</td><td>8</td></tr>
<tr><td>60</td><td>16</td></tr>
</table></td></tr>
<tr><td>Page 4 Table 2</td><td>Stress factors are not necessarily independent, as assumed when multiplying them. Therefore, this concept should be applied with caution.</td><td>Introducing additional degrees of freedom through the use of Arrhenius-type calculations can help better capture and improve the accuracy of assessments.</td></tr>
<tr><td>Page 4 Table 2</td><td>REP

Stress factor Ambient temperature</td><td>Reference temperature has to be mentioned</td></tr>
</table>

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<tr><th>Page/Clause</th><th>Comment</th><th>Suggested change</th></tr>
<tr><td></td><td>For LAB applications, it is common practice to use Arrhenius-based calculations, which are generally considered to be technology-agnostic. Specifically for LAB, the currently applied values may not accurately reflect actual conditions.</td><td>Reference temperature 20°C
<table>
<tr><th>$T_{Ambient}$ in °C</th><th>$SF_{T, Rep}$</th></tr>
<tr><td>20</td><td>1</td></tr>
<tr><td>30</td><td>2</td></tr>
<tr><td>40</td><td>4</td></tr>
<tr><td>50</td><td>8</td></tr>
<tr><td>60</td><td>16</td></tr>
</table></td></tr>
<tr><td>Page 4 Table 2</td><td>REP

Charge or discharge C-rate</td><td>Values are missing.

Generally the most experience on battery life expectancy exists for life tests based on existing battery standards. For C-rates deviating from those used for standard tests accuracy is limited. This accuracy is not good enough to justify technology disruptive decisions.</td></tr>
<tr><td>Page 4/5 Table 2</td><td>Ambient temperature is not equivalent to the operating temperature. While the ambient temperature impacts the operating temperature, the expected lifetime of the battery depends on the operating temperature of the battery. The operating temperature is usually higher than the ambient temperature. Therefore, the stress factor SF(Trep) seems to be underestimated.</td><td>According to our calculations SF(Trep) in table 2 for 33-40°C is closer to the value of 2 in the table 1 SF(Tond) for the same temperature regime.</td></tr>
</table>

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About EUROBAT
www.eurobat.org

EUROBAT is the leading association for European automotive and industrial battery manufacturers, covering all battery technologies, and has more than 40 members. The members and staff work with all policymakers, industry stakeholders, NGOs and media to highlight the important role batteries play for decarbonised mobility and energy systems as well as numerous other applications.