SKELETON TECHNOLOGIES

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SkelCap

Ultracapacitor Cellpack Handling Guidelines

TECHNICAL NOTE

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SkelCap
ULTRACAPACITOR
SERIES HANDLING GUIDELINES

This document provides handling guidelines for SkelCap series ultracapacitor cellpacks.

Date	Revision	Description
03.07.2019	02- MNL-190708/1	Initial release

Scope

+ To protect assembled ultracapacitor cellpacks during handling and assembly, it is important that some basic principles are followed during handling of capacitor packs. By adhering to following guidelines, risk for damaging the capacitors should be removed.

Handling Guidelines

+ It is not allowed to bend or stress the cellpack out from its original shape. Stress on the busbar will cause gasket deformations in the cells which might lead to leaking of the cell.

+ Welded packs must be handled using a supporting structure (e.g. use a flat support structure below the cellpack, it is preferred to use non conductive material) underneath the pack to prevent movement and bending of the welded pack.

Figure 1. Example of good handling of the cell-pack. The cell-pack is placed on a flat structure which supports all the cells.

Figure 2. Example of not allowed method of handling the pack. From the image it can be seen that the cell-pack is deformed, this type of deformation can cause cell damage.

Assembling Ultracapacitors to Packs

+ For assembling the ultracapacitor cells in to different series or parallel configuration laser welding should be used. To learn more about laser welding of ultracapacitors please read „SkelCap Ultracapacitor Series Welding Guidelines“.
The document can be found here http://www.skeletontech.com/downloads.

- When joining ultracapacitors with busbars it is not allowed to stress the cells. Following handling/ fitting methods are prohibited:
  - It is not allowed to hammer the busbars to achieve fit between ultracapacitor and busbar.
  - It is not allowed to stress the cell with more than 500N of force.
  - It is not allowed to twist the terminals of the cell

When using prohibited handling methods there is a likelyhood that cell might be internally damaged or damage to the gasket which migth lead to electrolyte leak from gasket.

- Appropriate package size – Use the smallest possible parcel size. Please consider sufficient amount of material around the welded pack for the cushioning of the welded ultracapacitor pack.

- When cellpack are assembled in to enclousure, then it is not allowed to have more than 500N of force per cell. Please note that due to cell length tolerance all the cells are not exactly the same length, therefore the applyed load form the casing migth not distribute evenly across all the cells in the pack.

- Additional information for guidlines for enclousure and cell balancing systems can be found in „SkelCap user Manual“ http://www.skeletontech.com/downloads.

Transporting of Assembled Ultracapacitor Packs

- Depending on the transport method suitable packaging solution should be used. Packaging must withstand different environmental factors which can be present during freigth (Vibration, shock, humidity, etc.)

- The welded cellpack must be fixed in the parcel in a way which prevents movement of the assembled cellpack. If assembled cellpack can move, there is danger to stress the cells beyond 500N which can result cell damage.

- If there are any longer busbars reaching out from the cellpack, special care must be taken, in order not to damage the potruding from the cellpack or the cells themselves.

- In packaging the cellpack should be placed on a flat surface, if needed to protect from vibration or shock the cushioning material should be below the flat surface. For example to use cardboard below the cellpack and under the cardboard additional layer of foam is used.