

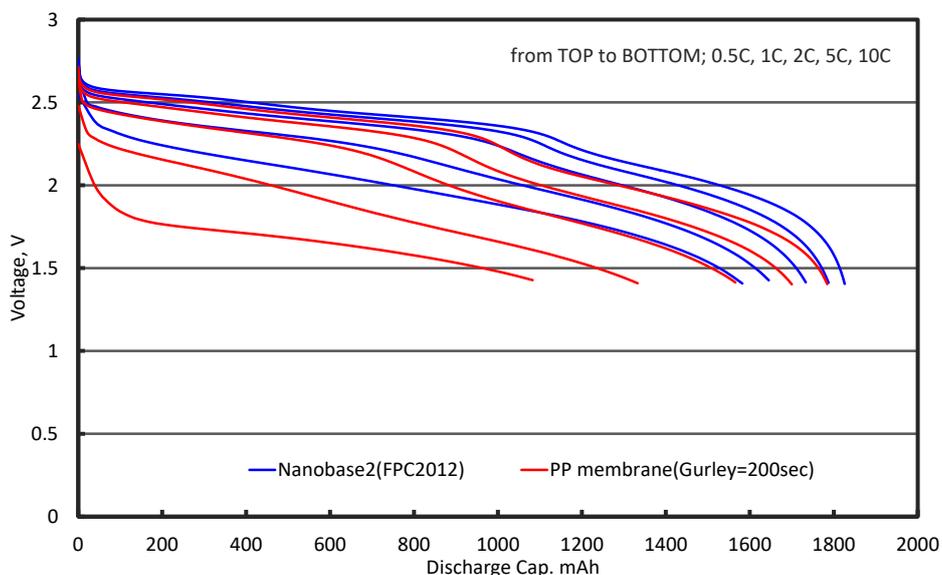
NanoBase2 as a separator for LTO-LIB

Lithium Ion Battery with Lithium Titanium Oxide anode (LTO-LIB) has outstanding charge/discharge performance and cycle life compared with conventional LIB. LTO-LIB is the most suitable device for applications where characteristics of both conventional LIB and EDLC (supercapacitor) are required.

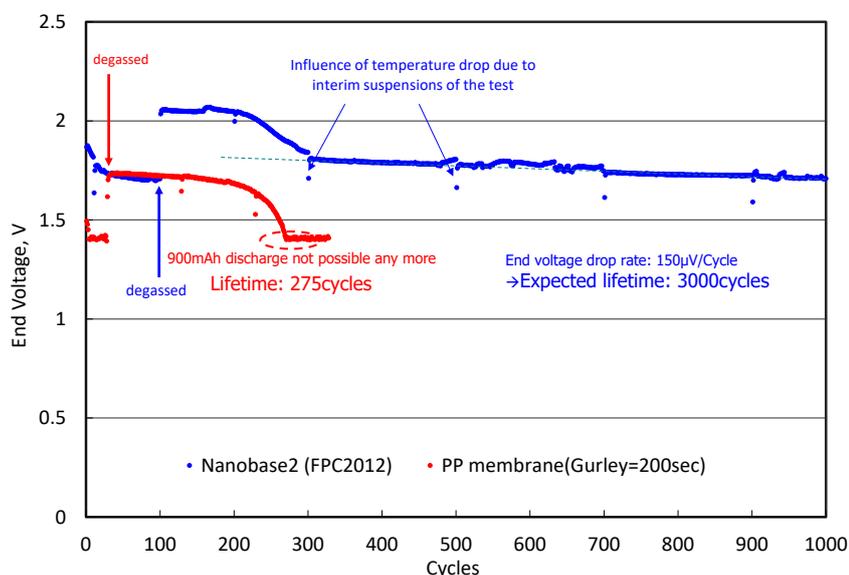
This application note explains why and how NanoBase2 should be used for LTO-LIB.

Benefits

- Low internal resistance
- Resistance lower than PP and PE separators can be gotten.



- Easier gas diffusion
 - Accumulation of decomposition gas in electrode assembly largely affects battery performance and is a critical issue of LTO-LIB.
 - In electrode assembly using NanoBase2, the decomposition gas can diffuse much smoother than in electrode assembly using conventional membrane separator.



- Stable to high temperature drying
 - High temperature drying to eliminate moisture contained in LTO is an essential process to get proper performance of LTO-LIB. However heat stability of conventional PP/PE separator limits the drying temperature to 100°C.
 - NanoBase2 is stable to vacuum drying at 150°C*. This enables better moisture elimination of LTO anode material.
- * Heat stability of materials other than separator (especially, package material and electrode binder) should be considered.

Things to be aware

- Due to its mechanical characteristics largely different from PP and PE membranes, stacking and winding machines optimized for conventional LIB may give improper result. Use of stacking and winding machines optimized for EDLC is recommended in that case. NanoBase2 is widely used for EDLC and manufacturing equipment for EDLC is optimized for NanoBase2
- Insulation resistance of NanoBase2 under high humidity is much lower than that of membrane separators. Insulation (short circuit) test condition for conventional LIB may give wrong result. Test under lower voltage and lower threshold resistance is recommended.
- Use of NanoBase2 combined with higher drying temperature of electrode assembly reduces amount of decomposition gas. However, the amount may be still much more than that of conventional LIB. Process design that enables multiple degassing steps is recommended.

Please ask our sales department for more information.