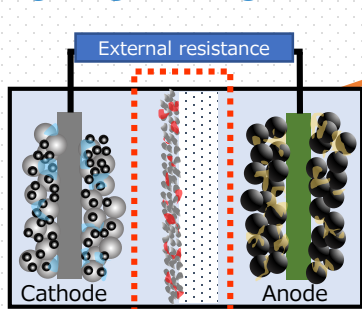


BONRON™ SAH and MSP

The fire accidents in laptops, electric vehicles, and mobile phones caused by thermal runaway of the inside Li ion batteries (LiBs) frequently occurred. To solve this problem, high heat-resistant separator have been strongly required. Bonron™ SAH and MSP is expected to be a binder for increasing heat resistance of ceramic coated separator.

Bonron™ for LiB CCS



Separator
 • prevent a short circuit

Binder
 AlO₃ or AlOOH



PE separator

- ✓ Water based, environmentally friendly
- ✓ High adhesion to PE film (untreated film)
- ✓ High heat resistance until more than 150°C

Ceramic coated separator(CCS):
 To prevent from PE porous film melting down resulting short circuit between Cathode and Anode

Performance of Bonron™ for CCS*1

Product	SAH-01	MSP-02	Conventional binder
Thickness	4 μm		
Thermal shrinkage 150°C×60min	16% 	9% 	65%
200°C×20min	- 	9% 	-
ΔAir Permeability (sec/100mL)	15	25	15
Adhesion to PE film	Excellent	Excellent	Good

*1 Evaluation conditions are described at the reverse side

Physical Properties of Bonron™ for LiB CCS

	Bonron™ SAH-01	Bonron™ MSP-02
Appearance	Yellowish brown	Transparent
Solid content (%)	13.5– 15.5	15.0 – 17.0
pH (-)	5.5 – 7.5	6.0 – 8.0
Viscosity (mPa·s)	2000 – 4000	< 100

The above data are not standard values

Coating conditions

<Materials>

Filler: Boehmite (Nabaltec, APYRAL AOH60)
 Dispersant: SN5468 (SAN NOPCO)
 Binder: Bonron™ and Commercial grade
 Wetting agent: OLFINE E1010(Nissin Chemicals)

<Coating conditions>

Blending ratio: filler/dispersant/binder/wetting agent=100/1/4/1.5
 wetting agent was not added for Bonron™
 Solid content: 40%
 Substrate: Non-corona PE microporous film (Thickness : 8µm)
 Dry thickness: 4 µm
 Drying condition: 50°C×3min

Test conditions

a) Heat resistance

- After coating, cut out 5cm square samples
- Heat resistance test at 150°C × 60min and 200°C × 20min
- Evaluated by shrinkage (average of MD/TD)

b) Air permeability

- Measured with a Wangen-type air permeability instrument.
- Evaluated by the difference from the base PE's air permeability (180s/100ml).

c) Adhesion

- Test by rubbing the coated surface with eraser rubbing (400g loading)

-Contact detail-

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